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FRONT COVER

The equipment racks of amateur radio station VK3BW/VK3AOM permanently on display at the Melbourne Science Museum. See story on page 9.
Photo courtesy of Science Museum of Victoria, Photographic Section.

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See Page 22

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amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA, FOUNDED 1910



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The Wireless Institute of Australia exists to provide a service for its members. Australians who are interested in amateur radio.

However, like many similar organisations, it has reached the stage where it cannot function effectively without paid staff.

The amount of work which can be expected from unpaid volunteers becomes increasingly difficult due to the many side attractions of the affluent society in which we live.

But paid staff means more money. More income from more members.

Why are only 50 per cent of the licensed amateurs in Australia members of their own radio organisation?

Surely not all of those 3000 non-members are inactive, or freeloaders. (Freeloaders. Non-members who reap the benefits of the expenditure of time and cash of members.)

If they are not members because of disenchantment with policies, facilities, or even personalities, then they are burying their heads in the sand.

They should become active members of the Institute and bring about change. After all, the Institute is only as good as its members, and it is a society of amateurs for amateurs.

One school of thought is that "AR" should provide the additional income. But "AR" barely stands on its own feet.

If the content was widened to include hi-fi, stereo, and other general electronics, the public may be interested in buying it on the news-stands. But then the magazine would cease to be "personal" to amateur radio.

How long is it since you put something constructive back into this fascinating hobby of ours? Attended a meeting, submitted an article to "AR", assisted one of the many groups in the Institute, signed up a new member?

Or are you just a taker?

The Wireless Institute of Australia is your society. And without your active assistance, IT WILL NOT SURVIVE.

BILL ROPER, VK3ARZ

MARITIME MOBILE, LAKE EYRE

Plans are well advanced for an expedition of Melbourne amateurs to Lake Eyre during May. Two members of the Publications Committee (VK3ABP and VK3YFF) among others, expect to operate maritime mobile on the HF bands from a sailing

boat for a period of about two weeks. It is also hoped to provide good publicity for amateur radio as well as Australia's impressive inland sea by producing a documentary movie of the expedition. Lake Eyre has been full of water for about two years and looks like remaining full for some time to come.

making the most of mercator

part 2

A. M. Phillips VK5ZU
27 Prospect Terrace, Prospect, SA 5082

SATELLITE TRACKING

The methods outlined in Part 1 (AR November 1973) are further developed to plot the path of a satellite in near-circular orbit and to determine its position in space and time with respect to a given observer, by use of a simple overlay.

THEORY

The track of a satellite in circular orbit is typically as shown in Fig 7. It can be shown that the latitude of point B and its longitude with respect to point A, the ascending node, are related to the orbital inclination (angle BAC) and the orbital travel (angle AOB) as follows:

$$\sin \text{Lat } B = \sin \text{BAC} \cdot \sin \text{AOB}$$

$$\sin \text{Long } B = \frac{\cos \text{BAC} \cdot \sin \text{AOB}}{\cos \text{Lat } B}$$

Also, if "t" is time from ascending node
Orbital travel angle $\text{AOB} = \frac{t \times 360}{\text{period}}$

If time intervals of four minutes are used in calculation, allowance can be made for the rotation of the earth simply by adding one degree of longitude for each four minutes.

Calculated data for the orbit of Oscar 6 is given in Table 2 and plotted in Fig 8.

Fig 9 shows the path of Oscar 6 in elevation. For a given elevation, "E", the angular range "R" can be computed as follows:

$$\sin F = \frac{6370 \sin (90+E)}{7830}$$

$$R = 90 - (E+F)$$

giving the following values:

Elevation E						
(°)	0	15	30	45	60	75
Range R						
(°)	35.6	23.2	15.2	9.9	6.0	2.9

Circles of constant elevation (range), when plotted on a Mercator chart will appear as shown in Fig 10. The points of intersection of these curves with lines of given bearing at point A can now be computed, using the formulae derived in Part 1 and above as follows:

Given:

Example

Latitude "a" of reference point 35 deg

Bearing "b" at reference point 45 deg

Range "R" from reference point 23.2 deg

Compute:

$$s = \cot b \cdot \sec a \quad 1.221$$

$$y = \arcsin \frac{\tan s^2 + \tan^2 a}{s} \quad 54.6 \text{ deg}$$

$$x = \arcsin \frac{\tan y}{s} \quad 29.8 \text{ deg}$$

$$0 = \arcsin \frac{\sin a}{\sin y} \quad 44.7 \text{ deg}$$

$$0 + R \quad 67.9 \text{ deg}$$

$$\text{Lat } P = \arcsin [\sin (0+R) \sin y] \quad 49.1 \text{ deg}$$

$$\text{Long } P \text{ (from point 0)} = \arcsin \frac{\sin (0+R) \cdot \cos y}{\cos \text{Lat } P} \quad 55.0 \text{ deg}$$

$$\text{Long } P - x \quad 25.2 \text{ deg}$$

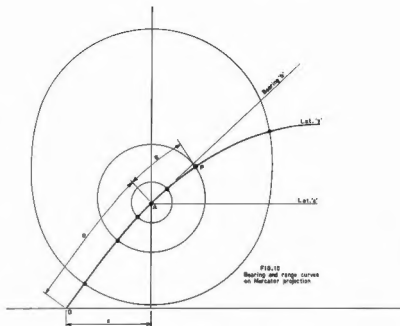


FIG. 10
Bearing and range curves
on Mercator projection

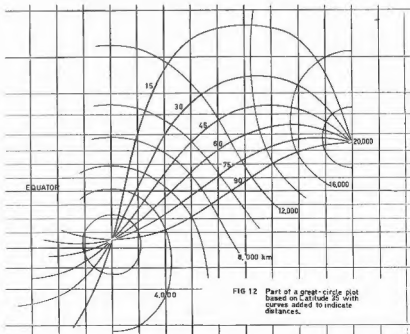
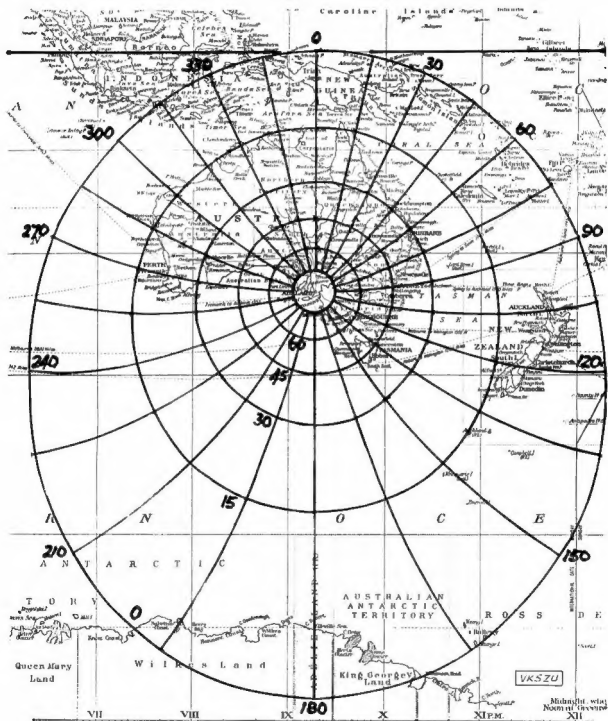


FIG 12 Part of a great-circle plot
based on Latitude 35 with
curves added to indicate
distances.

Ascending Node - Northbound

250 240 230 220 210 200 190 180 170 160



Ascending Node - Southbound

60 50 40 30 20 10 0 350 340 330

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Please allocate 10 sales points to the
(club or section of WIA). I understand that when my nominated club/division gains 100 sales points you will present them with a FREE fully guaranteed unit.

Name _____ Callsign _____

Address _____

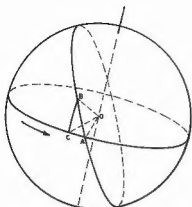


FIG. 7. Typical satellite orbit.

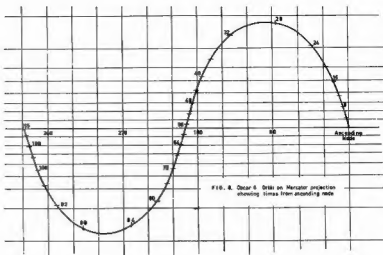


FIG. 8. Oscar 6. Orbit on Marsator projection showing times from ascending node

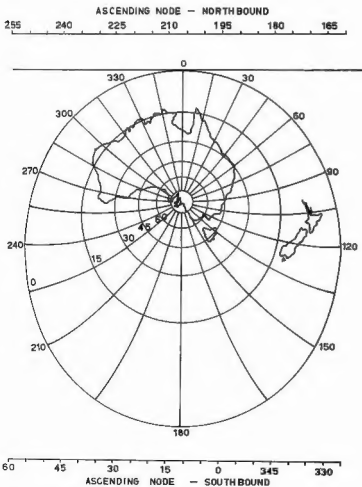
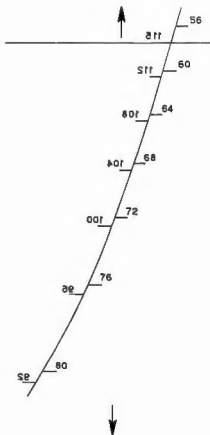


FIG 11 (a) Bearing/Elevation chart for Oscar 6
Altitude 1460 Km.



(b) Track of Oscar 6
(Latitude 0-70°S)
Showing times of ascending node

Repeat for all desired values of R—positive and negative. Repeat for next value of b.

APPLICATION

Using a Sharp Model PC-1001 programmable desk calculator, the complete plotting data was obtained in less than half an hour. Another half-hour was required to carry out the manual plot, the result of which is shown in Fig 11a.

That portion of the Oscar 6 orbit from 55 to 82 minutes after ascending node was then plotted on transparency to the same scale. (Fig 11b). By superimposing the two plots, with due regard to the longitude of the ascending node, the time and bearing of acquisition can be read off directly and the pass can be tracked in detail.

To cover the northbound leg, the transparency was reversed and time-markers from 92 to 115 minutes were added, together with the appropriate index for longitude of the ascending node.

The most time-consuming part of the exercise is the calculation and plotting of the bearing/elevation curves. To simplify this, the problem was fed to a Hewlett Packard Model 9810A Calculator and its

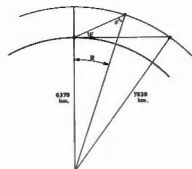


FIG. 9. Oscar 6 orbit in elevation.

associated X-Y plotter. The complete calculation and plot was then carried out in about two minutes.

Note: In plotting to Mercator's projection, if unit length is taken as one degree of longitude, then a point at latitude X will be $131.9 \log - \tan(X + 45)$ units from the equator. 10^{-2}

FEEDBACK TO PART 1

The method used above provides an alternative means of deriving the great-circles

shown in Fig 5 of Part 1, together with additional curves indicating distance from the reference point. Such a plot is shown in Fig 12.

Note: An angular range of 9 degrees represents 1000 km.

TABLE 2
ORBITAL DATA RELATING TO OSCAR 6
Orbital inclination 78.35 deg. Period 114.89 min

Time (mins)	Orbital Travel °	Latitude	Longitude, deg W from ascending node	
			Earth stationary	Earth rotating
4	12.5	12.3N	2.5	3.6
8	25.1	25.5	5.4	7.4
12	37.6	36.7	8.6	11.8
16	50.1	45.7	13.6	17.8
20	62.6	50.4	21.3	26.3
24	75.1	51.2	37.3	43.3
28	87.7	56.1	78.6	85.5
32	100.2	74.8	131.6	139.6
36	112.7	64.6	154.2	163.2
40	125.2	53.1	164.0	174.0
44	137.6	41.2	169.6	180.6
48	150.3	29.1	173.4	186.4
52	162.6	16.8	176.4	189.4
56	175.3	4.5N	178.1	193.1
60	187.8	7.7S	181.6	196.6
64	200.4	16.9	184.3	200.3
68	212.9	32.1	187.4	204
72	225.4	44.2	191.6	208
76	237.9	55.1	197.9	216.6
80	250.5	67.4	206.8	229.6
84	263.0	76.4	238.6	259.6
88	275.5	77.1S	285.4	317.4
92	288.0	68.7	328.2	351.2
96	300.5	57.8	341.1	365.1
100	313.1	45.7	347.8	372.8
104	325.6	33.6	362.1	378.1
108	338.1	21.4	355.4	382.4
112	350.6	8.2	358.1	386.1
116	360	0	360	388.7

FOOTNOTE:

Received recently is data relating to the orbit of Oscar 7 which indicates that, for all practical purposes, it is identical with that of Oscar 6. The comparative data is as follows:

	Oscar 6	Oscar 7
Inclination (deg)	101.6534	101.7287
Period (minutes)	114.994355	114.944785
Regression (deg)	28.74897	28.736
Semi-major-axis (km)	7832.583	7830.336

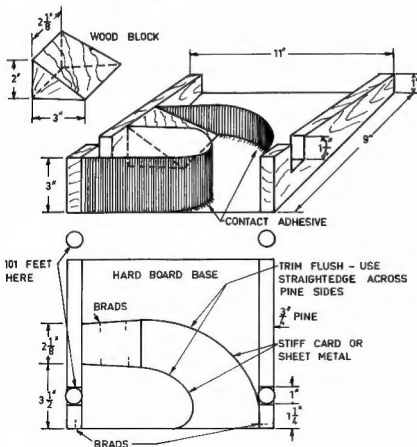
The differences are so small — much less than the plotting accuracy of the diagrams, that they will apply equally well to both Oscar 6 and Oscar 7.

Try This

with Ron Cook VK3AFW
and Bill Rice VK3ABP

THE YAESU 101 AUDIO QISLICK

Most 101 users find it hard to think up an improvement. Here's one if you have an hour to spare. I have found it works so well that I am going to paint it! Build it and you can remove those magazines or such used to prop it up, place the rig on top, locate the front feet into the slots provided and hey presto, you have real beaut out front sound and a 101 that looks you right in the eye. The unit has no ill effect on the ventilation and will also serve as a mobile fitting.



The Melbourne Science Museum Amateur Radio Station

Peter Cossins VK3BFG/T
and David Turner VK3ADE

To the majority of people, mention of the word 'Museum' conjures up images of dusty old bones fused over by ageing recluses and a place once visited when very young, probably on a wet day.

This picture however, is not accurate. There are collections, some of which seldom see the light of day, but the Science Museum has many activities going on, and mechanised displays to demonstrate fundamental principles to the delight of both young and old.

Over the past 103 years of its existence, the Science Museum has engaged in various activities involving the general public including the training of telegraphists (1873), lectures on geology, chemistry, etc. and more recently (1965), lectures on astronomy in the planetarium and the observatory. The latter service is provided by the Astronomical Society of Victoria, utilising both their own and Science Museum telescopes. Also on the staff of the Science Museum are five teachers seconded from the Education Department, who give demonstrations both at primary and secondary level on sound and light, including a CCTV link via laser. Other technological topics such as development of musical instruments, transport and communications are illustrated with items from the collections.

The Museum is always looking for ways to increase its activities, and resulting from a chance discussion with Jim Lloyd VK3CDR, in late 1973, a joint WIA/Science Museum radio station was conceived. The main objectives of this station were:

- to provide a facility to educate the public in radio communications, particularly amateur activities; and
- to accommodate the VK3BWI broadcast equipment.

After agreement on facilities and services to be provided by both parties, a suitable site was selected for the station. Consideration was given to staff access and attraction of visitors' attention. Visitors number 500,000 per year (one seventh of Victoria's population). The position on the ground floor of a gallery facing Swanston Street, although a premier position for operation, was quite distant from suitable roof top antennas (HF — 130m, VHF/UHF — 30m). Good quality UR67 and FHJ (Helix) co-axial cable was installed to overcome transmission losses. After nearly twelve months, stage one has been completed — comprising the installation and modification of VK3BWI equipment, the construction and installation of a control console, and a console with HF and VHF transceivers for the Museum station VK3AOM.

The VK3BWI console is a multi-program source, three-output audio, system to drive the transmitters which are housed in racks.

RF feedback problems encountered were largely solved by the addition of LP filters inserted at strategic points within the console. Much of the equipment which was transferred from the old QTH at 478 Victoria Parade, was in poor repair and was given an extensive face-lift.

At the time of writing this article, the 432 MHz transmitter has been built but no antenna has yet been installed. All co-axial feeders are in a sealed duct and hence an interesting problem is posed for any further expansion of frequencies. The possibility of diplexing transmitters into the single cable feeding a dual resonant antenna is one possible solution.

As mentioned earlier, there are two foot top antenna sites, one directly above the transmitting room for VHF (which can be seen from Swanston Street) and one towards the rear of the building for HF.

Antennas are as follows:—

- 160m — Vertical with top hats and counterpoise,
- 80/40/20 — Inverted vee (a tri-band beam and tilt over tower is planned for stage 2)

- 53.032 MHz — $\frac{1}{2}$ vertical
- 52.525 MHz — $\frac{1}{4}$ G-plane
- 144.5 MHz — Stacked clover leaves
- 146.1 MHz — $\frac{1}{4}$ vertical/10 element beam

432 MHz — Still in planning

From a public point of view the station demonstrates a range of equipment used by amateurs from the ex Navy A14 (80 and 40 Mx), amateur designed and constructed AM (160m, 2m, 6m, 70cm), modified commercial equipment (Ch 1, 6 FM), a 40m transmitter constructed from a kit; and state-of-the-art, a HF transceiver with digital readout and an autoscanner VHF transceiver. Public demonstrations have commenced and acquisition of gear for RTTY, SSTV and UHF TV is planned.

Comparison of these wide ranging current activities can be made with items in the Museum's collection, such as the receiver built by Max Howden VK3BQ in 1923.

If you are interested in operating or demonstrating in your field of interest, please contact Peter VK3BFG/T on (03) 231-2778.



Peter Cossins, VK3BFG seated at the operating position of VK3BWI/VK3AOM. This photo was taken during the callback immediately after the opening ceremony.

SIDEBAND ELECTRONICS SALES and ENGINEERING

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Model FT-200 AC transceivers with AC FP-200 supply	\$400
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All TRIO-KENWOOD & YAESU MUSEN transceivers come complete with original English manual, all crystals for all available bands, a P.T.T. dynamic microphone and a bonus free S.W.R. Meter.	

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TH6DXX 10-15-20 M. senior 6 el. Yagi 24' boom	\$225
204-BA 20 M. monoband 4 el. full size Yagi 26" boom	\$190
HY-QUAD 10-15-20 M. full size Cubical Quad	\$200
Magnetic base mobile whip 108 MHz and higher with 18'	
RG-58U cable and coax plug	\$18
BN-86 baluns	\$18

CDR ROTATORS

AR-22-R for 2 & 6 M. and small h.f. beams	\$50
AR-20-R for 2 & 6 M. beams	\$40
HAM-II with re-designed control box	\$150
All three models for 230 V AC complete with indicator-control units.	
4-conductor light cable for AR-20-22	20 cents per yard
12-conductor light cable for HAM-II	30 cents per yard
8-conductor heavy duty cable for HAM-II	60 cents per yard

BARLOW WADLEY RECEIVERS

Model XCR-30 Mk II 500 KHz to 31 MKz continuous coverage communications receivers, crystal controlled reception of AM-USB-LSB-CW	\$250
--	-------

27 MHz EQUIPMENT

MIDLAND 5 WAM 23 channels transceivers, with PTT mike 12 V DC	\$95
MIDLAND 5 WAM 15 W PEP SSB 23 channels transceivers PTT mike 12 V	\$175
SIDEBAND Brand One Watt model NC-310 hand-held transceivers	\$50
SIDEBAND Brand 5 WAM 15 W PEP SSB 23 channels transceivers, with noise limiter-blanker, PTT mike, 12 V DC	\$190

144 MHz TWO METER EQUIPMENT

MULTI-7 10 W output FM transceivers, 24 channels with crystals for 10 channels 40 to 60, includes all Australian repeaters and anti-repeater operation, with PTT mike and mobile mounting bracket, 12 V DC operation, still only	\$225
KEN PRODUCTS KP-202 2 W output FM hand-held transceivers with the hottest receiver available anywhere, 6 channels now with crystals for channels 40 and 50 and all 4 repeaters	\$150
KCP-2 battery chargers and 10 NICAD batteries	\$35
Leather carrying case for the KP-202 \$6: Stubby flexible helical whip antennas for the KP-202 \$6.	
KLM ELECTRONICS solid state 12 V DC 2 M. amplifier, 12 W output, automatic antenna change-over when driven, ideal for mobile use with the KEN KP-202 \$50.	

All prices quoted above are net SPRINGWOOD, N.S.W., cash with orders, sales tax included in all cases, subject to changes without prior notice. No terms nor credit nor COD available, only cash and carry, no exceptions. All-risk insurance available for 50 cents per \$100 value, minimum insurance \$0.50. Allow for freight, postage or carriage, excess will be promptly refunded ... MARY & ARIE BLES, Proprietors.

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POWER OUTPUT METERS

Galaxy RF 550A with 6 position coax switch	\$75
--	------

SWR METERS

Midland twin-meter type for 52 Ohms, up to 1 KW on hf	\$22
---	------

BALUNS

Japanese baluns, 1 KW PEP 75 Ohms impedance only	\$10
--	------

MOBILE ANTENNAS

MARK helicals 6 feet long		
	HW-80 for 80 M.	\$18
	HW-40 for 40 M.	\$18
	HW-20 for 20 M.	\$16
	high power KW-40 for 40 M.	\$25
	tri-band HW-3 for 10-15-20 M.	\$25
Swivel mobile mount & chrome plated spring for MARKS		\$12
ASAH! model AS-303A set of 5 whips 10 to 80 M.		
Complete with ball mount and spring		\$90
AS-2-DW-E 1-4 wave 2 M. mobile whip		\$8
AS-WW 1/2 wave 2 M. mobile whip		\$15
AS-GM gutter clip mount with cable & connectors		\$10
M-RING body mount and cap for 2 M. whips		\$5

COAX CONNECTORS

Amphenol VHF types Standard PL-259, Angle male-female, T-connector, RCA male to Amphenol female adaptor. All models	\$1 each
---	----------

CUSH CRAFT ANTENNAS

DGPA 52 to 27 MHz adjustable ground-plane	\$25
LCA-2 lightning arrestors	\$6

CRYSTAL FILTERS

9 MHz similar to the FT-200 ones, with 2 carrier crystals	\$35
---	------

POWER SUPPLIES

240 V, AC to 12 V DC 3 to 3.5 Amps, regulated	\$35
---	------

SPECIAL

KEN KP-12A speech processors, 230V AC, contain a complete SSB generator, 10-7 MHz filter, clipper, etc.	\$100
---	-------

a mini size field strength meter

Maurie Evered, VK3AVO
13 Sage Street, Oakleigh, 3166

A field strength meter is one of those instruments that falls into the "useful but not essential" class. However, since this one was first constructed, it has worked overtime. I am sure other operators will find it as useful as I have.

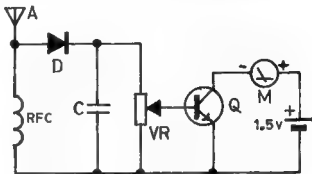
This field strength meter could not be simpler. It consists of only seven components including the meter and battery. It was built on a piece of Veroboard and everything is mounted in a 4" x 2" x 1 1/4" metal box. The "antenna" is a piece of brass welding rod about six inches long. It passes through a rubber grommet and is soldered directly to the Veroboard.

The circuit is very straightforward. Transistor Q1 is normally non-conducting because there is no external bias applied to its base. RF voltage developed across RFC1 is rectified by D1 and applied to the base of Q1 which then conducts according to this rectified RF voltage. VR1 is to keep the meter reading at 1/2-3/4 full scale deflection. Once this circuit is enclosed in its metal box it is virtually a DC one, so layout is of little importance. There is little more to be said about the instrument itself, it is so simple. However, a few words should be said about its use.

If the meter is used to measure relative transmitter output in the regular station antenna (as it is usually used at this QTH)

then readings are quite straightforward and follow those obtained on the SWR meter in its "Forward" position.

The field strength meter is completely



RFC-2.5 mH

D - 0A91

C - .001

VR - 50k

Q - BC 106 (2N3565)

M - Any meter 0-1mA

(or more sensitive)

A - 6 inch length brass
welding rod.

Independent of coupling to feedlines, and so gives added confidence compared to any other method of measuring that is used. Just sit the field strength meter in a convenient position on your operating table or desk.

If the meter is used to monitor antenna adjustments the situation is more complex because —

1. The "antenna" of the field strength meter should have the same polarisation as the transmitting antenna under test
2. Measurements should be made at a distance of several wavelengths from the antenna being tested. If made within one wave length the meter may respond to the combined induction and radiation fields rather than the radiation field alone
3. If an adjustment alters the angle of radiation of the antenna under test it may decrease the measured field strength at ground level although the total radiation level may have increased.

This meter has been used from 3.5 to 30 MHz satisfactorily. If it is to be used at 1.8 MHz with a low power rig it may be necessary to extend the short antenna with a piece of wire and a clip. If this is done it performs very well at this lower frequency.

This little meter is very cheap and easy to construct and once built becomes a very useful addition to the range of instruments in any shack.

In this photo of Maurie's neat station the field strength meter can be seen to the left of the FT101B.

the shack

J. A. Gazard, VK5JG
39 Glenhilly St., Woodville South, S.A. 5011

The construction of an outdoor building to house the amateur station need not necessarily require the services of a builder. VK5JG describes one way in which you may be able to "roll your own", subject, of course, to the agreement

At over the world the place in which the amateur operates his equipment is called "The Shack". The dictionary defines a of your local council. shack as "a roughly built hut" and it is probable that the name evolved when in the early days, the roaring spark gap working late into the night made it necessary for the amateur to move into an outhouse so described.

Today, there are still advantages in having an operating room outside the main residence. Two of these are the ease of leading-in the aerial and the avoidance of interference with the remainder of the family. With the increase of new operators from Youth Radio and the coming of the novice licence, more shacks will be required and the following suggestion is offered for cheap and easy home construction.

MATERIALS

Common covering material for walls and roof are corrugated galvanised iron or asbestos cement sheets. The costs per square foot of galvanised sheets and 6 inch corrugated asbestos cement sheets are ap-

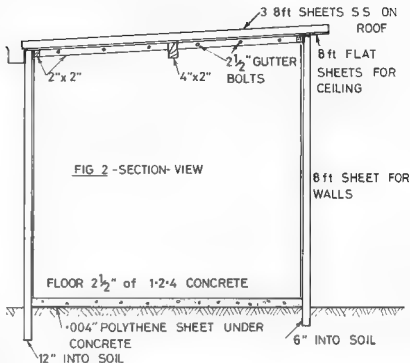
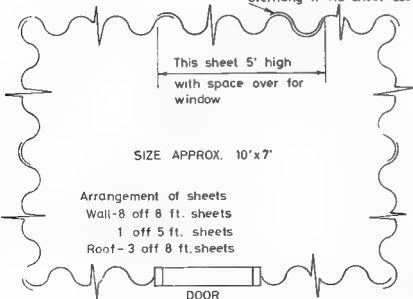


FIG 2 - SECTION- VIEW

Double lap to allow roof overhang if AC sheet used



SIZE APPROX. 10' x 7'

Arrangement of sheets
Wall-8 off 8 ft. sheets
1 off 5 ft. sheets
Roof-3 off 8 ft. sheets

proximately the same. However "super six" asbestos cement sheets are sufficiently strong and rigid to stand up as walls and support a roof without timber framing. Used thus they are by far the cheapest material for walls. Also, with no timber framing, erection is simple and no special skills are required.

The super six sheets have a wide corrugation at one side which laps with the narrow one at the other side. If two sheets are set up at 90 degrees with the wide corrugations together, it will be found that the edges overlap and can be bolted together with 1" x 1/4" gutter bolts to form a corner.

LAYOUT

The layout of sheets for a 10 ft x 7 ft shack is shown in Fig. 1. Gutter bolts are used to bolt the edges of all sheets together.

The bottoms of the vertical sheets can be set in a shallow trench and backfilled and rammed to hold them upright during construction. The trench need only be 6" deep on the high side, and with a 6" roof fall, will be 12" deep on the low side. It is best to lay out the walls flat on level ground first, with the laps nesting neatly, and drill the 1/4" holes for the gutter bolts with a masonry drill. Bolts can then be inserted quickly during erection, which should not be done in a gale!

FIG 1

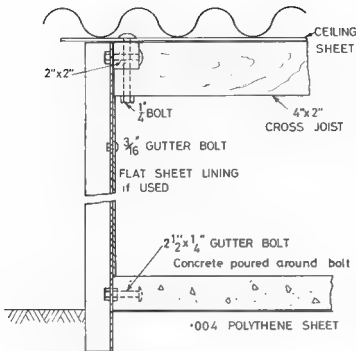


FIG 3 CONSTRUCTION DETAILS

PROCEDURE

It is possible for one man to erect the walls of a small shack in less than a day. The sloping tops of the side walls can be cut with a ceramic cutting disc set in an electric drill. Erection is commenced at one corner. The two sheets are carefully

set up at 90 degrees and clamped at the top with a G-clamp. Then the holes (4 per corner) are drilled and the bolts inserted. The corner will have sufficient stability to support two more sheets even if the trench is left unfilled. Around the top of

the sheets, lengths of planed 2 x 2 inch timber are bolted to the asbestos sheets, with 2 1/2" gutter bolts. This increases the rigidity and provides a method of fastening down the roof.

ROOF

The roof can be of galvanised iron or super-six. To provide a flat ceiling and block off the open spaces of the corrugations, sheets of flat asbestos are laid on the roof first and the corrugated sheets placed over them. Special screws are available for fastening the asbestos (if this is used) to the 2 x 2s.

When the roof is screwed down with two screws per sheet at each end, the structure becomes very rigid.

Aluminium foil can be laid between the flat asbestos and the corrugated sheet for heat insulation.

DOOR AND WINDOWS

One sheet left out of the wall provides a doorway and the use of a 5 ft sheet instead of an 8 ft sheet makes space for a window. The door and window frames can be made of 4 x 1 1/2". The doors will not be standard size and so will have to be made to fit. It is suggested that doors be framed in 2 x 1 inch and 3/16" hard-board be glued and screwed to each side. For a 3 ft x 3 ft window, half (about 18") could be plain glass and the remainder louvres.

If it is desired to line the shack, flat asbestos sheets can be bolted inside to the super-six with 3/16" gutter bolts. This lining, which can be painted, greatly improves the appearance and insulation.

The shack shown in the sketches is 3 sheets by 2 sheets — approximately 10 ft x 7 ft but other sizes can be used. The largest shed built by this method has been 5 sheets by 3 sheets (16 ft x 9 ft). If super-six is used for the roof, one of the laps in the wall will have to be a double lap so that the roof will have an overlap at each end.

Try This

with Ron Cook VK3APW
and Bill Rice VK3ABP

TWO-WIRE REVERSING OF AC/DC SERIES MOTORS

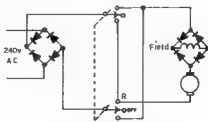
When the distance between shack and tower is a long one, it is desirable to keep the number of wires to the rotator down to a minimum. At the same time, those of us who make their own rotators find that the most inexpensive suitable motors are the series-wound AC/DC motors commonly used in electrical appliances. The problem is how to use these motors with the ON/OFF-reversing switch at the shack and still require only two wires to feed the motor.

The problem has been overcome here

by using two bridge rectifiers as shown in the diagram. The motor is supplied with DC via a bridge rectifier from 240V AC. The field, which is still used in series with the armature, is connected through another bridge rectifier which causes it to retain the same polarity at its terminals regardless of the armature polarity, which is controlled by the switch in the shack.

We use a little motor that previously drove a blower. It was found necessary to change the field position slightly in respect of the brushes to obtain similar torque in both directions, and a filter has been fitted near the motor to cut commutator noise down. The diodes in the bridges are normal 400 p.i.v., 0.5A rectifier types.

'Tubby' Vale, VK5NO



Two wire reversible AC/DC Series Motor.

MAY IS VHF/UHF

MANY NEW LINES IN STOCK OR ARRIVING SHORTLY
Including the value-packed commercial quality **PFT-203 TRANSCEIVER**



The model PFT-203, originally designed for marine use in America, is a 30 watt plus, 25 channel mobile FM transceiver for the 2m amateur band. It is compactly housed in a metal cabinet of attractive appearance. The IF amp frequencies are 10.7 MHz and 455 kHz, clear of HF amateur bands to reduce interference to a minimum. Excellent selectivity is assured by the use of a 2 pole crystal filter and three ceramic filter A low pass filter is included in the antenna circuit for both transmit and receive. It incorporates power level adjustment and automatic SWR protection which does not cut the transmission on high SWR but reduces power according to SWR deficiency. Thus you can still transmit even with a relatively poor SWR . . . good for emergency, etc. situations. The use of a large area heat sink and PA transistor with power dissipation of 70W help to ensure trouble-free operation under arduous conditions. One channel provides priority "call-channel" operation.

TECHNICAL DATA OF PFT-203

GENERAL

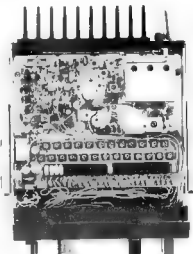
Frequency Coverage	140-170 MHz, factory adjusted to the 2m band
Number of Channels	24 Channels plus 1 memory channel
Maximum Bandwidth per Unit Mode	2 MHz
Power Source	F3 (Phase Modulation)
Power Drain	13.5V DC ($\pm 10\%$) Negative Ground
	Receive 0.3A
	Transmit 5.0A/25W
	1.2A/ 1W
Operating Temperature	-20°C to +55°C
Antenna Impedance	50 ohms
Microphone	Dynamic 500 ohms
Dimensions	61 mm (H) x 166 mm (W) x 215 mm (D) or 2 3/8" x 6 1/2" x 8 7/16"
Weight	2.2 Kgs or 4.8 lbs.

TRANSMITTER

Power Output	30 Watts or 1 Watt, switchable (max.)
Modulation	Variable capacitance phase modulation
Multiplications	12 Times
Frequency Deviation	12.5 kHz max. (adjustable)
Harmonics Spurious Radiation	2 μ W or less
Adj. Chann. Radiation	2 μ W or less
Frequency Stability	Not exceeding $\pm 0.001\%$ (-20°C to +60°C)
Mod. AF Response	0.3 to 3 kHz ± 6 dB/Octave

RECEIVER

Receiving System	Crystal controlled double superheterodyne
Frequency Stability	Not exceeding $\pm 0.001\%$ (-20°C to +60°C)
Intermediate Frequency	1st IF : 10.7 MHz 2nd IF : 455 kHz
Sensitivity	0.5 μ V or less at 20 dB QS
Selectivity	± 10 kHz at -6 dB, ± 20 kHz at -80 dB
Spurious Response	Greater than 60 dB
Spurious Radiation	0.002 μ W or less
Intermodulation	At least 75 dB down at ± 25 kHz separation
Audio Output	1 Watt (less than 10% distortion)



INTRODUCTORY PRICE — \$226. Includes crystals for B and one repeater chan. (advise chan. required), microphone, mobile mount, etc. Extra standard channels only \$8.00. Prices include S.T. Freight or postage and insurance extra (allow \$4.50). All sets pre-sales checked and covered by our 90 day warranty. Prices and specifications subject to change.

AUSTRALIAN AGENT:



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Ph. 89-2213

W.D. MITCHELL, Patent Att., 1st Floor, 100, Market Street, Sydney, 2000
N.S.W. STEPHEN KUNH, P.O. Box 54, Mascot, 2020

S.A. FARMERS RADIO PTY. LTD., 257 Angas Street, Adelaide, 5000 Ph. 23 1288
W.A. H. R. PRIDE, 28 Lockhart Street, Como, 6152 Ph. 80 4379

MONTH AT B.E.S.



TENKO 2XA

The Tenko model 2XA (similar to the Swan FM2XA) is a 10 watt, 12 channel 2m FM transceiver. Using dual gate MOS FETS in the front end it exhibits excellent cross modulation and overload characteristics. The 2XA comes complete with mobile mount, microphone, and DC power cable.

TECHNICAL DATA:

Transmitter: Power output, 10 watts. Deviation, ± 7 kHz. Spurious Response: -60 dB
Receiver: Sensitivity, $0.5 \mu V$ for 20 dB quieting. Selectivity 6 dB down at ± 12.5 kHz, 50 dB down at ± 25 kHz. Squelch sensitivity: Less than $0.3 \mu V$. Circuitry. Double conversion with IFs of 10.7 MHz and 455 kHz.

INTRODUCTORY PRICE — \$169, includes 3 JA channels and 2 Aust. channels. Extra standard channels, \$8.00.

YAESU FT-620B

New model 6m SSB/AM/CW transceiver, illus. at right **PRICE — including AM filter and crystal calibrator — \$468.**

YAESU FT-220, 2m SSB/FM/CW transceiver, latest model with crystals and mods for FM repeater operation. Similar appearance to FT-620B. Limited quantity only — \$475.

YAESU FT-224, 24 channel 2m FM transceiver — \$259 with 6 Australian channels installed.

YAESU FT-2 AUTO, 8 channel, auto-scan 2m FM transceiver.

YAESU S-200R, 200 channel, frequency synthesised 2m FM transceiver.

NEW FROM STANDARD CO.:

SR-C145A, 2m FM 2W output, 5 channel Walkie-Talkie. This superior quality transceiver comes complete with a leather carrying case, and auxiliary jacks are provided for external microphone, earphone, antenna and battery charger. Whip antenna telescopes down level with top of set

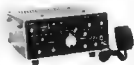
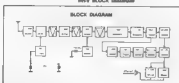
TECHNICAL DATA:

TRANSMITTER:		RECEIVER
RF output	2 watts	0.4 μV or less
Modulation	± 5 kHz (adjustable)	60 dB down on adjacent channels
Spurious & Harmonics	More than 50 dB below carrier	Double conversion
FM noise	At least 45 dB	Circuitry

PRICE — \$158, includes carrying case and 4 Channels (2 U.S. and 2 Aust.). Optional accessories extra, e.g. hand mic., stubby ant., charger, mobile mount adaptor, 230V AC home use adaptor.

RECEIVER SENSATION

MR-2 MINI-RECEIVER for pocket use. A little larger than a cigarette packet, the MR-2 is a full double conversion crystal controlled VHF miniature receiver of really high quality 12 channel capability. Delivery expected June/July with anticipated price under \$100, including self-contained Ni-Cad batteries, earphone, wire antenna, and battery charger. Crystals will be stocked for the 2m band.



SR-C432A, a new UHF, 70 cm handheld FM transceiver, output power 2.2 watts, with 6 channel capability (435 MHz crystals included). Similar appearance to the SR-C146 transceiver. **Price — \$235.**

SR-C430 UHF 70 cm mobile transceiver, 10 watts FM, 12 channel (435 MHz crystals included). This would be the bargain of the year at the anticipated price of \$268, inc. mic and mobile mounting bracket. Stocks expected in June, place your order now to avoid disappointment.



All prices Inc. S.T. Freight etc. extra. And . . . don't forget, your purchase from B.E.S. Includes pre-sales checking of sets plus our 90 day warranty.

AUSTRALIAN AGENT:

baill

ELECTRONIC SERVICES

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modifications to the VK3ABP 2 and 6 metre converters

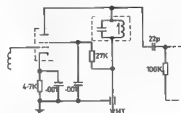
Geoff Wilson, VK3AMK
7 Norman Ave., Frankston, Vic. 3199

It was with some delight that one of the technical editors, VK3ABP, received this article for perusal. He also has found an IF tuned circuit desirable in one case when an IF above 30 MHz was used. The article explains some of the factors involved in choice of IF, and how such a tuned circuit may be added where necessary.

The VK3ABP VHF converters need no introduction to anyone active on 2 or 6 metres over the last decade. There would probably be very few shacks that have not had at least one of these at some stage. I have lost count of the number that I have built and every one was a good performer. In the early days of Ch. 0 the 6m version seemed about the only converter capable of solving the cross mod. problem. Some idea of the success I have had can be seen from the DX of the last season: 2m, VK1-7 inclusive, 6m, VK1-0 & 2L1-4 inclusive, in addition to five JA call areas in other years. All signals received on the standard 2 or 6m version.

The trend today is to use 28 MHz as the tunable IF for VHF converters for a variety of reasons, not the least being the 2 MHz or more available compared with other bands. Unfortunately few receivers give their best performance at 28 MHz, especially when compared to say 80m where gain is usually more than adequate. My 6m converter, while a good performer and relatively free of cross mod, except when beaming directly at Ch 0, seemed to lack the sensitivity of the classic "R, TV & H" type converter which used a 6BQ7 front end. Unfortunately the latter was totally unsuited for operation in Ch 0 areas and had to be abandoned despite its previous excellent performance. My impression has always been that the 6m VK3ABP converter obtains freedom from cross modulation at the expense of gain.

The mixer stage output is untuned and the signal is coupled to the IF by an untuned cathode follower. Therefore the first tuned circuit at the IF is the front-end tuning of the receiver. I set out to see where some additional gain could be



MODIFIED MIXER CIRCUIT - FIG. 2

obtained without drastic modification to the converter, especially as the tunable IFs at 28 MHz were not as hot as they might be. The reason for using untuned circuits in the mixer and cathode follower areas appears to have been to make things as flexible as possible and allow IFs from 8C upwards to be used.

The original mixer circuit is shown in Fig. 1 and the modifications in Fig. 2.

The 10 K resistor in the anode of the mixer section of the 6BL8 is replaced by a tuned circuit at the IF and tests on DX signals on both 2 & 6m have shown a very worthwhile increase in gain without increasing cross mod. The 6m version was simply peaked for maximum at 28 MHz but due to the gain of the 6ES8 cascade RF stage ahead of the mixer in the 2m version it was found necessary to back off the tuning slightly as the noise was too great and produced a standing S meter reading of about S6. By backing off the tuning until the S meter just reaches zero with no signal the gain is about right and should give somewhere in the vicinity

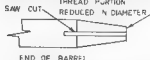
of 2 to 3 S points improvement over a converter without this modification. The 6m converter, due to the lower gain of the RF amp, does not give any noticeable increase in noise. During a recent 2m opening to VK5, I monitored the VK5VF beacon for long periods and found that the signal was in the noise and not moving the S meter at all without the addition of the tuned IF circuit but as soon as this was added the signal rose to about S3 and was quite clear. Also car ignition was much more pronounced and there was a noticeable rise in background electrical noise, inaudible previously. I made my tuned circuits up on Neocel formers and fitted cans, then soldered the tuned circuits in, directly replacing the 10 K resistor (15 K in the case of the 2m converter). Coil dimensions will vary of course depending upon the IF used. Should any instability result from the addition of the tuned circuits try a damping resistor across the coil; values probably between 22 K and 47 K would be suitable.

Try This

with Ron Cook VK3AFW
and Bill Rice VK3ABP

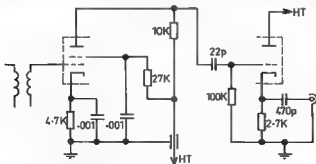
MODIFICATIONS TO MINISCOPE BUILDING IRON

After a period of use, the barrel (although made of stainless steel) oxidises in the thread where the bit screws in, leading to overheating due to poor contact and accelerating the oxidation process. Cleaning the thread with a 5/32" Whitworth tap helps for a short period, but erosion of the barrel thread leads to a poorly fitting bit. To overcome this, a slot was cut in the barrel with a hacksaw blade with the "aet" ground off each side (so the cut will not be excessively wide). Cut through the thread on one side, being careful not to damage the thread on the opposite side,



the cut extending a little beyond the tapered part of the barrel. With a pair of fairly heavy pliers, carefully reduce the size of the thread portion by pinching together the cut. Try and maintain the threaded portion circular. Run a 5/32" Whitworth tap through to thoroughly clean the threads. Pinch the end in until a new bit is a firm fit, requiring pliers to screw it in. It pays to clean the thread with a tap each time a new bit is fitted and also check that the new bit is a firm fit in the threads.

G. P. Daw, VK2AGJ



6BL8 MIXER - CATHODE FOLLOWER - FIG. 1

VHF UHF an expanding world

with Eric Jamieson VK5LP

Forreston SA 5231
Times GMT

AMATEUR BAND BEACONS

VK0	VK0MA Mawson	53.100
	VK0GA, Casey	53.200
VK1	VK1RTA Canberra	144.475
VK2	VK2WL, Sydney	52.450
	VK2SW, Sydney	144.010
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.600
	VK4WJ, Mt. Mowbullen	144.400
VK5	VK5VF, Mt. Lofry	53.000
	VK5VF, Mt. Lofry	144.800
VK6	VK6RTV, Perth	62.300
	VK6RTU, Kelso	52.350
	VK6RTW, Albany	52.950
	VK6RTW, Albany	144.500
	VK6RTV, Perth	145.000
VK7	VK7RTT, Devonport	144.800
P29	PB9GA, Lae, Muggli	62.150
3D	3D3AA, Suva Fiji	62.500
ZL1	ZL1VHF, Auckland	145.100
	ZL1VHF, Warkata	145.150
ZL2	ZL2VHF, Wellington	145.200
	ZL2VHF, Palmerston North	145.250
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

The only item of likely interest in regard to beacons at present is the information from Bill VK2HZ to the effect that on his elevated site at Springwood in the Blue Mountains of NSW he monitored the F1 beacon 3D3AA on 8/1/75 from 0900Z to 0905Z, being audible for the full four hours very slow fade — not typical E fading. Signal 58 at maximum down to 52 at times. Again on 7/1/75 the beacon was heard from 0830Z to 0900Z with signals peaking 53 about 0845Z, otherwise as just being audible for most of the period.

If the beacon can be encouraged to keep on air it may well be that towards the end of the year in particular, contacts could be made into what will be a new country for most 6 metre operators.

52 MHz FM SURVEY

Well, some people at night read the VHF notes. Two letters have arrived talking to ask George VK3ASV for apparent errors in relation to VK2 FM activity. The first is from Bill VK2HZ who mentions he has worked 239 different VK2 stations on 52 MHz during the past eight years. 95 per cent of them would have been on the primary frequencies of 52.525 FM and 53.865 AM, the remainder on AM or SSB. To clarify the position a quote from Bill's letter "George, VK3ASV, has his lines crossed when he lists VK2 52 MHz net frequencies in "52 MHz FM Survey" (AR March 1976).

"The primary frequencies are 52.525 FM and 53.865 AM and have been for the last ten years at least (longer for AM frequency). The VK2A/W broadcasts appear on these two frequencies, also at 52.100 SSB.

"Some 10 or seven years ago 52.658 was generally adopted as a secondary FM frequency. The use of an additional frequency was necessary due to the activity on 52.525 and to provide a spot where stations could enjoy a quiet year, without too much competition.

"On the AM side 53.865 was used extensively before Low Band FM Car-phones became readily available, when many stations moved to 52.525. The Ilwacra (Wollongong) WIA Branch used 53.862 especially for fox-hunts and the like, in recent years the use of AM nets has fallen with FM operating taking over.

"It would be fair to say that 52.525 FM operation is on the wane, except of course during the DX season when the 'wood-work' opens up!

"The reason for this reduction in activity could possibly be blamed on the ready availability of 144/146 MHz 'air-boxes' with the added interest of repeaters and multi-channels. Just another phase in the ever-changing pattern of

VHF activity"

Thank you Bill for setting the facts straight, and George will now be able to bring his book up to date too.

While on the subject of net frequencies, repeaters etc it is to be a fact that if one should travel from VK5 through VK3, VK2 to VK4, and north to Townsville, one will need about 7 different repeaters. It seems to be able to have a reasonable coverage of the country? And is it also true that in addition to the main four repeater channels, 1 to 4, on 2 metres FM, VK2 look like using Channels 5, 6 and 7? I guess it would be reasonable to say most operators would consider fitting at least the four primary channels 1 to 4, plus Ch. 40 (B) and Ch. 50, the national simplex frequency, but to be asked to add three more repeater channels seems beyond all reason.

If thoughts are proceeding along these lines, might I suggest some thought be given to Interstate operators as well. Mike to have your own special operator on say Ch. 6, as long as it's also OK to only talk amongst yourselves in the main! So there! Now someone tear me apart and tell me how wrong my grievance is, because I will be glad to be told I am wrong — I will be through the eastern States before too long and I am certainly not going to sit up on Ch. 5, 6, 8 and 9.

And still further to the FM business, Jeff VK2BYV writes to confirm what Bill VK2HZ has already noted above, but adds there is little or no WICEN activity in Sydney now or for some years. However, moves are under way to revive WICEN in VK2. Thanks Jeff for writing too.

The Bundamba Amateur Radio Club advises that as from 2/1/75 channel 50 will be the Club's 2 metre calling and net frequency, so you guys travelling north through Queensland might bear this in mind. Note from Club Secretary D W Albrighton, Editor "AR".

DISAPPEARANCE

Not much to thank this time, but the 432 MHz equipment of the Ilwacra Branch which was damaged by lightning last October has been largely repaired. It is noted the FM14575 are now priced at \$44 each, duty free after a price drop. However such transmitters provide a NF of 1.5 dB which is pretty good for 432 MHz. A new PA also for the transmitter is being constructed to allow for the production of 700 watts of RF output from 1000 watts input, which represents a 3 dB increase in transmit power.

The high ERP signals from WASLET on 22/2/75 were received by VK2MAW, the Groups EMC station, from 0800Z to 0845Z up to 8 dB above the noise, but repeated calls from VK2MAW were not acknowledged.

Incidentally the Ilwacra Branch of the WIA have adopted a name for their magazine, "The Propagator". So now you will know what I am referring to in the future!

SPECIAL HF BEACON

Although HF news may be rather foreign to these columns, nevertheless, this information may still be of some use to VHF operators. The NZART Upper Hutt Branch are now operating a beacon on 28.170 MHz, and is part of the RSGB World Wide HF Net, being broadcast from New Zealand. "Break in" March 1975. Call sign ZL2MHF, Free. 28.170 MHz, Modulation, F1, call again about every 10 seconds. Antenna Vertical half-wave omnidirectional, Location Mount Clemis, Upper Hutt, near Wellington, 850 m ASL. Power input 90 watts, continuous operation.

Because the factors governing communications on 28 MHz are linked to a certain degree with those pertaining to 52 MHz, this 28 MHz beacon could be useful with its continuous operation. The fact that it can be heard at all in VK indicates a rise in the MUF, and good strong signals could be heard a hand cooking around 52 MHz and above. With so many transceivers around these days, it could well be that some good could come from monitoring the frequency on which the beacon operates during those odd moments when you are in the shack doing something else but sitting under the air. It might be a good idea to tune down to this beacon during the time of any 52 MHz openings and see how strong it may be; from this you could probably work out a pattern related to signal strength which will indicate just how high the MUF might be. Think about it! As you have probably noticed from the lack of specific information little has happened on the

6 and 2 metre scene this month — as seen from the airway. However, this could mean some of the usual operators are improving equipment while those habitually on the FM nets are constructing tuneable equipment — I wonder! Thought for the month "A man must keep a little back where he can be himself without reason in solitude alone can he know the true freedom."

The Voice in the Hills

Contests

with Jim Payne, VK3AZT
Parsons, Geelong,
Box 87, East Melbourne, Vic., 3002

ROSS HULL VHF-UHF CONTEST

Although a few days of grace were allowed for late entries some did not arrive until later and consequently y could not be included in the results published in the April issue of AR.

Section (A) —		2955	569
Section (B) —	VK2BHO		
	VK3BMD	1448	866
	VK3AUJ	1258	833
	VK3JYE		694

The PO Box 87 is normally cleared once each week and twice weekly when competition logs are coming in. It is not possible for us to allocate more than a few days grace unless the subsequent publication of results is to be delayed for a month. Sorry for late.

REMEMBRANCE DAY CONTEST

When you read this the popular Friendly Contest will be only four months away. So mark the calendar for August 15/16 and tie plus some pencils. Maybe we will have some variations to both the rules and the scoring system as recommendations have been made to the Federal Council and some decisions should be made at the forthcoming convention to be held in Melbourne during the weekend of April 23/25/27. Unfortunately there has been very little response to my suggestion in the Feb issue of AR to reduce the amount of detail required in logs.

However, one VK5 has a gem of an XYL who wrote "Having written out very lengthy log sheets from this call sign for 21 years I can see no great advantage in changing the format of the RD log sheets, as suggested. Surely it could be no easier for anyone (non-technical or otherwise) than to copy page for page from the official station log". Well, not many of us may be so fortunate and I pondered the matter again last weekend while disposing of last year's RD logs, a pile of foolscap almost 53 centimetres high, on the incinerator. There is so much detail on those sheets that the FCM does not require. Perhaps with a few short cuts we can get at least 1000 entries this time.

CONTEST CHAMPION TROPHY

This matter is being considered by the Executive but it is most unlikely that any announcement could be made until after the Convention.

CONTEST CALENDAR

May 10	World Telecomm Phone
11	Worked all Britain LF phone
15/16	USSR M-C DX
17/18	World Telecomm CW
17/18	Michigan QSO party (CW & Phone)
June 1	Worked all Britain LF CW
21	AR's A-Z Phone
22/29	ARL Field Day
WORLD TELECOMM CONTEST	
Phone	0000-2400 GMT May 10
CW	0000-2400 GMT May 17
Limited to single operator stations 10 through 160 metres. Use a separate log for phone and CW	
Exchange RST plus your ITU zone.	
Scoring	10/15/20 40 80/160
Same country	0 0 0
Other country	
same zone	1 1 2
Other zones	
same continent	2 3 4
Other continents	1 3 5 6

Each score 2000 total QSO points multiplied by different ITU zones worked. The same station may be worked on each band for QSO points but Zone is counted once only. Mail logs before June 30th to Ministerio das Comunicacoes, DENTAL, 70.000, Brasilia, DF, Brazil.
WORKED ALL BRITAIN
These contests are 12 hour affairs from 0900 to

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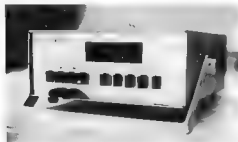
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2100 GMT on dates listed in calendar. The LF bands are 160, 80 & 40. Exchange RS(T) and QSO number UK stations will also give their country and WAB area number. Scoring: Each contact on 5 points. The same station may be worked on different bands for QSO points but not multiplier. This is determined by number of different UK areas worked. Logs go to R. L. Senior, G4BFF, 10 Toll Bar Av. Botesford, Nottingham, NG13, England.

10th ALL ASIAN DX CONTEST

Phone 1000 GMT June 21 to 1600 GMT June 22 CW 1000 GMT Aug 20 to 1600 GMT Aug 24
A brochure has been received setting out full details of these contests. The rules are detailed and a summary sheet is prescribed. You can also be named in the results for a defective log or a false statement in the report so please send a BASE to the FCM for complete details of this competition.

10th ALL ASIAN DX PHONE RESULTS

VK3NC	M	501	71	41,251
VK7DK	M	580	56	32,884
VK4VU	M	237	23	5,451
VK3BM	M	93	37	3,441
*VK2ZT	21	458	27	11,772
VK3WQ	14	95	8	289
VK3D	14	94	12	289

*Section winners.

Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

Dear Sir,

One of the highlights of my amateur year is the RD Contest.

I have enjoyed it for many years and hope to continue enjoying it for many more. The comments, criticisms and suggestions that follow are made with a view to stimulating discussion about and interest in the RD Contest and are not meant to be "shots" at anybody or any organisation.

To begin with, let us look at my definition of a contest—

A contest is designed to test operating skills, reliability of equipment and endurance of the operator.

I believe the first mentioned is most important and a good score (top ten) requires a good operator. The friendly contest spirit is OK providing it doesn't detract from the operating skill aspect. I can see no need to swap names in the contest unless I can add to my score.

Please remember that speed and accuracy are vital in a contest. The same skills are vital in emergency communication.

You will always be a good contest operator when the chips are down and the message must go through in spite of bad conditions.

Participation in the RD Contest should be encouraged for the above reason, if for nothing else.

Equipment reliability is a must, and whether you buy it or build it, you will find it gets pretty hot after 20-24 hours continuous operation.

Durability of the amateur? All I know is that each year it's a little harder to last the distance and it takes a little longer to recover, nevertheless I wouldn't miss the RD Contest for such minor discomforts.

RECOMMENDATIONS
Always there are recommendations about poor participation but I have already written on the subject of the handicap of counting non-starters in the score.

In VK3 we have the largest number of limited licensees but very very few participate. Some of the ideas given here may encourage more VHF participation but for starters what about a nominated VHF period during which VHF points score double? I would suggest midnight to 2 am for a trial.

When we are encouraging VHF operators to participate, let's also encourage HF operators to use all bands. Let's have a bonus or multiplier for operation on 160 Mx, 15, 10, 6 and 2 Mx. Say ten

1975 JOHN MOYLE MEMORIAL NATIONAL FIELD DAY RESULTS

24 HOUR DIVISION

Section (a) Tx Phone	VK4AL	2022
	3B9B	1890
	1AR	1850
	4FD	1650
	39CH	992

Section (b) Tx CW	VK3TX	487
	SOL	190

Section (c) Tx Open	VK3CAX	2183
	3AUQ	1284

Section (d) Tx Multiple Phone	VK3AWI	4079	4 ops
	BAS	3582	6 ops
	BLW	2843	6 ops
	3ANR	2296	5 ops
	3RY	715	3 ops

Section (e) Tx Multiple Open	P20PAG	6690	6 ops
	VK3ATM	6130	16 ops
	3APC	8726	16 ops
	3AWS	4844	11 ops
	1ACA	4752	8 ops
	2WQ	3736	12 ops
	1WI	3952	7 ops
	3IKK	2992	4 ops

Section (f) Tx VHF	VK3AVJ	1085
	2YCK	1051
	3AVE	554
	2ZCT	358
	4ZAF	228
	2YDV	182
	4ZGR	138

Section (g) Home Stations	VK3LM	545
	39CH	430
	3IKK	410
	3YIG	270

Section (h) Receiving L3-0042 370

6 HOUR DIVISION

Section (a) Tx Phone	VK3YQ	745
	3EP	473
	7BM	435
	3ADW	414
	7AX	110

Section (b) Tx CW	VK3YB	254
	2JM	182

Section (c) Tx Open	VK4AR	634
	3HE	410

Section (d) Tx Multiple Phone	VK3SR	1053	7 ops
	5KR	1057	8 ops
	4WIM	670	2 ops
	4AAX	668	2 ops

Section (f) Tx VHF	VK3ZHT	804
	2ZCX	214
	4ZLT	80

Section (g) Home Stations	VK7AL	525
	4LP	320
	3XB	360
	3RN	255
	2VM	70
	3ALD	48
	6LP	45

Section (h) Receiving R. J. Everett, Tas. 410

Check logs VK7RY, AHS

NOTE—Checking of logs not completed. Consequently scores and placings are subject to confirmation.

QSOs needed on each band to earn the bonus/multiplier for that band.

No bonus for 80, 40 or 20 Mx but for the amateur with limited facilities give an award for single band operation only.

REMARKS: This is always a point of discussion. How can it be made to balance between States of such widely varying amateur population.

I would suggest the following points be considered as a basis for determining the winning State.

- Score entries only — not non-starters.
- Total scores of top ten logs.
- A multiplier for number of bands used.
- Give a score for % increase in participation over, say the last three contests.
- Give extra score for number of entries with 100 or more points.

Balancing all that won't be easy but I'm sure one of our fraternity has access to a computer which could handle the problem.

To summarise, here are my suggestions for the contest:

- Bonus or multiplier for 10 or more contacts on each of 160 Mx, 15, 10, 6, 2 Mx.
- Double points for VHF intra-state from midnight to 2 am.
- Certificate for highest log entered as single band only.
- Allow points for different modes with same station on same band.
- Consider use of repeaters (I don't know if this would be good or bad).
- Re-vamp Winning State formula.
- What about a bonus for new modes such as SSTV?

No doubt there are more (and better) ideas floating around, so let's see what everyone thinks via the pages of this Magazine.

73's

Mike VK3WW

The Editor,

Dear Sir,

My wife, Betty, and I arrived in Australia, from England, at the end of November 1974 to visit

our son and his family in Sydney. Prior to our departure from England I had contacted many of my Australian radio amateur friends and received many invitations to visit them.

We are due to leave Australia on the 15th April '75 for home, via Singapore, and we wish to express our sincere appreciation and thanks to the many amateurs who afforded us such friendship and hospitality that we enjoyed.

I was privileged to be invited to the recent "Old Timers" meeting in Melbourne, and met many of the "Youngsters" who started off with smoke signals!

We were invited to the homes of VK4K5, VK3AAQ, VK3BM and VK3ON where we stayed and were treated like VIPs. We met so many "VK" amateurs and received the same wonderful hospitality that it seems unfair to mention any in particular!

I was impressed by the enthusiasm and knowledge of the Australian amateurs and the quality of performance of the home-brew equipment.

My wife and I agree that you have a wonderful country and such grand people — we thank you all for the wonderful time spent in Australia.

Yours sincerely,
Leslie and Betty Luscombe
GBNY, VK2BNY, FONY

The Editor,

Dear Sir,

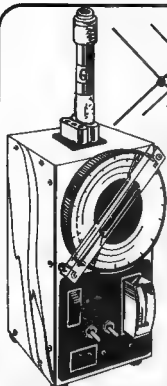
TOWNSVILLE PACIFIC FESTIVAL CONTEST 1975

The aim of the contest is to foster an interest in the Townsville Pacific Festival, and to increase interest and activity on all amateur Bands by Australian and New Zealand Amateurs.

It will be noted that a further effort is made in this contest to increase popularity of the CW Mode of communication. Hence all CW contacts count for double points.

This is the second year that the Townsville Pacific Festival contest has been run. Last year 1974 VK4IZ scored the highest points and received the trophy.

This year we wish to include the 2L and P20 to get some more interest in the contest. It is either win the contest the trophy will remain in



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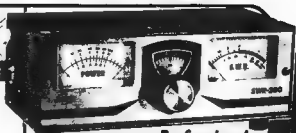
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	0-2W, 0-20W, 0-200W at 50/144 MHz	
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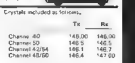
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I trust that all will enjoy the contest and make it as interesting as last year.

73c Good Luck, Hugh C. Barlow VK4AM Queens and Contest Manager

1. Time of Contest:
The Contest will be of 12 hours duration — 0200 GMT to 1400 GMT Saturday 15th June, 1975.

- 2. Sections:**
(a) Transmitting all bands phone only
(b) Transmitting all bands CW only
(c) Transmitting all bands Open.
(d) Receiving all bands. Open

- 3. Contacts:**
(a) CW contacts count as double score (CW to CW).
(b) One (1) contact per band per mode only.
(c) No cross band contacts.

4. Awards
(a) A certificate will be awarded to the highest scorer in each section for each call area. Per band
(b) The entrant with the highest score will be awarded a certificate

(c) Trophy awarded to entrant with highest overall score within Australia. Trophy to be held over until next contest

5. Scoring:
Bonus (a) For contact with VK4WIT — 15 points to be added to score on table below.

(b) VK4WIT and other Townsville stations can contact scoring for VK4WIT and other Townsville stations will be the same as for other VK4 stations.

However VK4WIT and Townsville stations receive no bonus points

Scoring for VHF & UHF:
Same as for HF except that on bands above 50 MHz — (i.e. Inter-site contacts are permitted) — for this purpose, a contact on frequencies above 50 MHz within an entrant's own call area will score 1 contact point. With the exception of VK4 where the Bonus rule applies for contact with VK4WIT or other Townsville stations.

Contacts on 160 metres:
Same scoring as in table with additional 6 bonus points per contact

Contact points as per table below:

	VK1	VK2	VK3	VK4	VK5	VK6	VK7	VK8	VK9	ZL
VK1	5	5	5	5	5	5	5	5	5	3
VK2	1	1	2	3	5	2	4	5	5	3
VK3	1	2	3	2	4	1	5	5	5	3
VK4	2	1	3	4	5	2	1	5	5	3
VK5	3	2	2	4	1	5	1	5	5	3
VK6	5	5	4	5	1	4	1	2	5	3
VK7	2	3	1	5	5	4	5	5	5	3
VK8	4	4	5	2	5	1	5	2	5	3
VK9	3	5	5	1	1	2	5	2	5	3
ZL	3	3	3	3	3	3	3	3	3	3

8. Band logs to:
Townsville Pacific Festival Contest,
P.O. Box 984,
Townsville, Q. 4810

9. Closing Date of Entries:
15th July, 1975.

P.S.—Townsville Station identify by:
(Phone)—VK4WIT Townsville
(CW)—VK4WIT/TVL

The Editor,
Dear Sir,

I think it is correct that technical errors in articles should be pointed out. I would therefore like to point out an apparent error in the diagram on Page 11 of March *Amateur Radio*, 1975.

The author of the article describes how to draw an ellipse which represents the earth's orbit around the sun. The orbit shown contains a major error.

The earth's orbit is not as elliptical as that shown in the diagram. This is quite excusable since an exaggerated diagram can often be used to illustrate a point in the diagram the major and minor axes are shown as being in line with the summer and winter solstices and the equinoxes. This is not correct but the difference is only 12 days and this is also a minor point.

The diagram shows the sun as being at the centre of the orbit and herein is the error. The sun is actually at one of the focal points of the ellipse. In the case of the ellipse the focal points are the points where the pins were used to do the drawing. The sun or focal point of the orbit always lies on the major axis and has its closest point along the major axis. The diagram shows the closest points lying along the minor axis.

The following are a few facts about the earth's orbit. The ratio of the distance from the centre of an orbit to the sun compared with half the major axis is known as the eccentricity of the orbit. In the case of the earth, the eccentricity is about 1 in 60 (an almost circular orbit). The earth is closest to the sun on the 3rd of January and furthest from the sun on the 6th of July. The difference between the closest distance to the furthest distance is about 3 million miles.

J. A. Adcock,
Member of the Astronomical Society of Victoria.

SWL

Would you like an SWL

column in AR?

What should this column

cover?

What do you want to see in

AR?

CAN ANYONE HELP OUT?

QSP FREQUENCIES

"So long as we depend on the publicly-owned frequencies for amateur radio a very existence, we had better make sure the public knows who we are and what we do." Quote of the month in QST, Oct '74

STATISTICS
Radio Communications for Nov. '74 advises that RSGB membership at the end of Sept. totalled 17,250 which included 1,320 overseas members and 1,020 associates in the U.K. At the end of Aug. '74 there were 25,332 amateur licences in force in the U.K.

DX QSL Notes

The following list of DX stations and QSL information has been supplied from Ken VK3AH

3C1AGD SWACKS

FB5YC FB5YD — FJMD or FBKAW

8Q6AC 8Q6AB — c/- Tokyo Village Marathi Rep of Maldiva Islands

SW0WV — US Embassy KAV APO New York NY 09259

7P8AQ — P.O. Box 1266 Masera, Lesotho

7P8AT — P.O. Box 1098 Masera, Lesotho

Z56BHW/308 — K Muler, P.O. 283 Mbatane, Swaziland

5U7HL — Rev T Schultz BP 8062 Tokoni Lome, Tonga

VU2ABC — WA1FEO

VP2KQ — Box 364 St Kitts, Windward Isles

VP2AB — J. Brown, Box 229, St Johns Antigua W. Isles

KV4BW — Box 3680 St Thomas American Virgin Isles

V56AO — Dr Lo Sailing Hongkong

OH7RF — Utsalo 81290 Finland

KG4GG — Box 12, Unawatna, PPO N York NY

KP4EAX/H18 — K. Gonzalez Rodriguez, Calle 27 No. 22 Ensenche Naco San Domingo D.R.

KX6LN — Box 1199 APO San Francisco CA9555

KX6LP — Box 1604 APO San Francisco CA9555

VK2BZM/9 Norfolk — VE3GUS (Direct eny)

FL8HH — H. Bouche, P.O. Box 10 Ali Sabah, French Somali and

VP2EEB — WA1REI WP42NH

PJ8IDX W84IDX

SP4PT/VE — SP4RU

ZMTAH and ZMTAJ — W5ZF

HD10RC — W4ETOY, John Croff 3528 Craig Drive, Lint Michigan 48905 (SASE & 3 IRCs)

CR7IC — AA. Pedro Jan Santos, P.O. Box 135 Porto Amélia Mozambique

W4STJ/VK56 — M Hitchcock Box 1619 Pago Pago U.S. Samoa

XE2RLP — Box 1147 Mazatlan Sin. Mexico

ZA3CP — Leslie Newport Gw. I, Le Bermuda

7Q7BC — Peter Conway Box 5595 Limbe, Masawi Central Africa (VQ2BG & 9J2BC)

CP1DN — Malcolm Chris Jensen Usaid Bolivia APO NY 09867 Casilla 573 La Paz Bolivia

A35AF — Kaku Inoue Box 19 Varua Tonga

C21AZ — Bati Baszaron P.O. Republic of Mauritius

PY2PCK — Gerardo Rios de Maza Rua Marques de Paranaigua 164 01303 — Sao Paulo Brazil Sin. America

7Q9AU — F. Humberto, Cordoba — Apartado Postal 248 Guatemala, C.A.

A4FQ — P.O. Box 1000 Muscat, Sultanate of Oman

VP2DH — WBHM

BR1AG — WA7TDZ

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VK ZL OCEANIA DX CONTEST 1974 RESULTS

	90	40	20	15	10	Total
Call	55	1355	6270	6490	1885	16035
1AMM	—	—	9842	2642	2360	14840
1ARV	795	1860	3875	2800	2675	12005
1MQ	55	458	5855	2905	1545	11815
1RFX	220	1320	6370	2845	730	11485
1AFW	—	—	1100	—	—	1100
1A1Z	1180	2425	1275	3275	2515	10670
1HV	155	55	5155	3225	1150	9735
1BHO	—	3715	—	—	—	5715
1BHJ	—	—	—	4820	4920	—
1IL	—	—	—	3995	3595	—
2JW	—	895	9420	8525	1075	17905
2TG	1215	2785	7870	3145	3675	17190
2ACP	185	—	6135	4050	3100	12490
2CD	—	—	8020	4280	12510	—
2APV	55	575	7785	2230	—	10625
2AKW	165	950	6195	2100	—	9420
2AH	—	—	—	4105	—	4105
2ABT	110	55	2445	285	510	3245
2AI	—	—	—	—	—	—
3GG	385	1145	3270	2320	1990	9390
3GQ	—	8995	—	—	—	8995
3BD	—	—	1505	—	—	1505
3BE	100	440	5945	3815	1635	11735
—	—	55	1810	3500	380	5545

	90	40	20	15	10	Total
Call	820	3925	10320	8155	3485	24685
1BXC	—	—	13345	—	—	13345
1RK	165	1185	6840	4850	800	12540
1AMM	—	—	15290	—	—	15290
1IL	—	—	9455	—	—	9455
1AGO	780	2085	1305	1940	1820	7915
1A1Z	210	165	3740	2170	520	7055
1BHQ	—	4090	—	—	—	4090
1BEB	—	—	—	3585	3565	—
1TB	—	—	1300	1000	1205	3605
1AQO*	920	—	—	—	—	1245
1BKL	—	—	—	—	—	—
27B*	155	1405	7440	3185	2000	14350
*plus 165 on 160 Mhz.	—	—	5095	—	—	5095
28CX	—	—	100	—	—	100
28X	—	—	4570	3290	480	8520
3US	—	1390	3385	1255	1220	7230
3GQ	185	—	1820	—	—	1985
3ABC	275	275	8580	4190	220	13540
4FX	—	1280	3885	—	—	4945
4GJ	—	—	—	—	—	—
*1MO plus 210 on 160 Mhz.	—	—	—	—	—	—
*1AQO plus 290 on 160 Mhz.	—	—	—	—	—	—

	90	40	20	15	10	Total
Call	830	3905	6565	5315	2595	19830
2	290	1875	7215	5085	2715	17180
2APK	210	590	6360	3910	2670	16740
2CX	—	2840	7485	2670	1910	15210
2BAC	—	—	5180	—	—	5100
2YB	—	530	2385	1090	—	4315
2VN	—	—	1810	555	—	2465
2VM	245	265	265	275	440	1490
3J	210	350	8210	2560	—	10740
3MR	—	—	9655	—	—	9655
3YD	—	3725	1435	290	—	7720
3CM	110	110	4390	1025	1015	6620
30B*	240	3185	—	—	—	4705
*plus 110 on 160 Mhz.	—	—	2010	575	315	2900
3HE	—	390	730	395	—	1485
3FC	—	—	345	—	—	345
3BEE*	160	10	2075	7325	3510	1380
4XA	—	1325	6080	3530	2645	13550
4UR	—	—	—	—	—	—
4RF	—	—	—	—	—	—
4EZ	—	—	2520	—	—	2520
4SF	55	—	610	400	855	2020
4X1	—	—	—	—	1445	—
4KX	—	—	—	—	—	—
5NO	345	1600	9400	6695	1985	19925
5OR	155	220	3430	450	420	4675
5QO	—	—	6505	4790	—	11235
6PG	—	—	590	—	—	590
7HE	—	—	165	190	—	265
7RY	—	—	—	—	—	—

	90	40	20	15	10	Total
Call	300	375	2820	1580	—	5085
1BC	55	220	3005	—	—	3280
1GB	380	—	1390	440	110	2325
1LF	400	880	5900	3555	2945	16990
2XT	55	1470	9020	3615	2915	16880
2APK	440	540	5805	3440	1020	11045
2ARA	—	—	5485	—	—	5485
2ABC	—	—	2590	1745	—	4335
2OW	—	—	265	275	215	755
2VM	110	105	8040	2505	2390	11380
3AFW*	—	580	5695	2285	—	8540
3ARY	—	—	1345	760	755	2860
3ASN	—	—	—	—	—	—
3TG	—	—	—	—	—	—
3WU	—	715	9780	5430	3615	19940
3YT	—	—	7070	2995	100	10185
4AU	—	—	6955	3515	—	9590
4AAU	—	—	55	5620	1340	9545
4B	—	—	5530	220	2735	8525
4UR	—	—	8050	—	—	8050
4Z	—	—	8015	—	—	8015
4PJ	—	—	1690	2070	1750	5520
4GA	110	375	1905	165	580	3135
4CX	—	—	—	1985	—	1985
5NO	—	—	6390	2010	1920	9320
5ZZ/T	—	—	6880	—	—	6880
6NE	110	910	3780	1730	1500	8630
6TD	55	—	3135	2385	155	5740
6PD	—	—	3170	1920	—	5090
6TU	580	—	1915	800	—	2785
6KP	55	165	2130	2285	1835	6240
6AZ	—	—	3450	1235	—	4685
DDM	—	—	320	—	—	320

	90	40	20	15	10	Total
Call	2410	2414	1742	1278	844	8484
DLSNU	5280	—	—	—	—	5280
DLSBC	2414	—	—	—	—	2414
DL1KB	1742	—	—	—	—	1742
DLK31	1278	—	—	—	—	1278
PJ0BK	844	—	—	—	—	844
DJ0XT	324	—	—	—	—	324
DM2AYK	1180	—	—	—	—	1180
DM2DU	416	—	—	—	—	416
DM2EOL	8	—	—	—	—	8
DM2DGO	check	—	—	—	—	check
E2A1A	380	—	—	—	—	380
F3KW	1068	—	—	—	—	1068
G3SEM	1030	—	—	—	—	1030
G3WJHF	668	—	—	—	—	668
H4KRCOV	105	—	—	—	—	105
HWSAF1	180	—	—	—	—	180
HBSUDJ	780	—	—	—	—	780
ISMPD	1610	—	—	—	—	1610
LA1KC	1850	—	—	—	—	1850
LA6HL	1578	—	—	—	—	1578
LA1K	1528	—	—	—	—	1528
LA4TG	670	—	—	—	—	670
LA7DS	218	—	—	—	—	218
LA5OK	38	—	—	—	—	38
LZ2RF	44	—	—	—	—	44
ON4PA	284	—	—	—	—	284
OH2NH	330	—	—	—	—	330
OH2BCV	1068	—	—	—	—	1068
OH2JMG	280	—	—	—	—	280
OH7NW	120	—	—	—	—	120
OH2LU	30	—	—	—	—	30
OK1MPP	1078	—	—	—	—	1078
OK1ATE	130	—	—	—	—	130
OK1MVG	190	—	—	—	—	190
OK1DVV	84	—	—	—	—	84
OK2BNQ	21	—	—	—	—	21
OK1MSP	18	—	—	—	—	18
OZ5KF	10000	—	—	—	—	10000

* denotes Multi Op. Station

	90	40	20	15	10	Total
Call	11451	1104	847	767	660	11451
JAI1PCY	—	—	—	—	—	—
JAI1MLK	—	—	—	—	—	—
JAI1AAT	—	—	—	—	—	—
JAI0BMS/1	—	—	—	—	—	—
JAI0BDB/1	—	—	—	—	—	—
JAI1WVK	—	—	—	—	—	—
JH1CXE	—	—	—	—	—	—
JH1XSA	—	—	—	—	—	—
JH1BLX	—	—	—	—	—	—
JH1LKH	—	—	—	—	—	—
JAI1RLJ	—	—	—	—	—	—
JAI1BUI	—	—	—	—	—	—
JA2HGA	6578	—	—	—	—	6578
JH21YR	1056	—	—	—	—	1056
JH21WF	1558	—	—	—	—	1558
JA2UJ	130	—	—	—	—	130
JA2BSD	80	—	—	—	—	80
JA3AAW	10084	—	—	—	—	10084
JA5CEK/3	1095	—	—	—	—	1095
JA5JXK	1068	—	—	—	—	1068
JA3AEV	884	—	—	—	—	884
JA3BEA	903	—	—	—	—	903
JA3BUN	132	—	—	—	—	132
JH3XCU	23	—	—	—	—	23
JA4AQR/3	31	—	—	—	—	31
JR3YUJ	3	—	—	—	—	3
JR3COC	check	—	—	—	—	check
JH3JCU	check	—	—	—	—	check
JA4BUI	6183	—	—	—	—	6183
JA4Z	168	—	—	—	—	168
JH4FYE	145	—	—	—	—	145
JA4VUD	140	—	—	—	—	140
JH4BXG	18	—	—	—	—	18
JA5EVQ	8	—	—	—	—	8
JA6NW	2064	—	—	—	—	2064
JH6DVA	1875	—	—	—	—	1875
JH6CAW	979	—	—	—	—	979
JH6LO	482	—	—	—	—	482
JA6EYD	760	—	—	—	—	760
JA6RCH	231	—	—	—	—	231
JA6JRI	468	—	—	—	—	468
JA6CM	270	—	—	—	—	270
JA6RLL	199	—	—	—	—	199

	90	40	20	15	10	Total
Call	1095	189	840	634	580	1095
VE3GCO	—	—	—	—	—	—
VE3RA	—	—	—	—	—	—
YS1MAE	—	—	—	—	—	—
YS1JAE	—	—	—	—	—	—
W1JNC	—	—	—	—	—	—
W2FCR	—	—	—	—	—	—
W2KGQ	—	—	—	—	—	—

	90
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QSP

OUR AMATEUR RESTRUCTURING

From an article in Jan '75 QST '75 as anticipated, FCC says we should have two routes of incentive licensing. One would be the present basic HF ladder of Novice to General to Advanced (and Extra). It is termed Series 'A' or the 'short wave' domain, defined as below 29 MHz. The second would be an expanded VHF-UHF progression with a new 'Communicator Class' as the entry point to feed technician ranks, and beyond it, an 'Experimenter Class' — a sort of 'super-tech', paralleling the Advanced level. An amateur would thus have to hold two types of license authorization to operate both below and above 29 MHz. The Extra Class would remain the top objective."

BARL

From the editorial in Radio ZS for Jan '75 it is observed that 1975 is the 50th Anniversary of the South African Radio League. ZS8VY in the editorial says 'our hobby cannot be conducted in isolation and thus by its very nature it depends for its fulfilment on the co-operation of others — there is no such thing as a one-way QSO'."

TELECOM 75

The Secretary-General of the ITU proposes a World Radio Amateur Convention be held within the framework of Telecom 75 scheduled for Oct 1975 (4th and 5th) in Geneva as part of the World Telecommunication Forum. Any member likely to be able to join in please write in to the Executive Office in Toronto.

ARE YOU UNFINANCIAL?

If you are your AR will have ceased and missing issues cannot be sent free of charge when you do pay up. If you are financial your AR will still be mailed out and you should still be getting it so long as the address is correct and there are no errors which might have accidentally crept into the system.

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1-16	1/2	16	3	No 3002 \$8.00
2-08	3/8	8	3	No 3006 \$1.08
2-16	3/4	16	3	No 3007 \$1.08
3-08	3/4	8	3	No 3010 \$1.28
3-16	3/4	16	3	No 3011 \$1.28
4-08	1	8	3	No 3014 \$1.42
4-16	1	16	3	No 3015 \$1.42
5-08	1 1/4	8	4	No 3018 \$1.58
5-16	1 1/4	16	4	No 3019 \$1.58
8-10	2	10	4	No 3907 \$2.29

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Reference: A.R.R.L. Handbook 1957

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B.E.S. NEWS

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A shipment from KW Decca Electronics U.K. is expected to arrive very soon. This will contain antenna couplers, baluns, dummy loads, low pass filters and multi-band trap dipoles. And, of course, Yaesu equipment for HF and VHF, including the new FT-620B, FT-220, FT-224, etc.

A USEFUL HINT!

When constructing or repairing equipment and you have a screw or nut to place in an awkward-to-reach position, try holding the screw in the end of a length of spaghetti insulation or stuck to the end of a screwdriver with a small piece of wax, and the nut partially screwed onto a piece of resin cored solder of suitable diameter or with 2 or 3 strands of thin solder twisted together.

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OK1KY5	84	UQ2GW	1056	WDGH	8	WLIK1	672
OK1KDR	80	UK2GW*	2147	W7IR	10495	WUHS	5735
OK1MGW	80	UR2REZ	416	WJJA	2258	WOBAM	1780
OK2BGR	75	UR2RQD	32	WQWM	548	WQHW	704
OK2BBI	70	UK3AD	4830				
OK2BHG	70	UK3ADO	182				
OK2SJ	30	UK3ABD	65	PT2GOK	30	HCIW	1872
OK1IAR	18	UK3ABB*	1734	PT7APK	11	LRADK	259
OK3KFO	18	UK4AL	234				
OZ1O	2728	UK4WAB*	2440				
OZ4PM	157	UR5LJ	790				
OS2ME	214	UR5GE	320				
PAD01	243	UR5VAA	114				
PA0VU	50	UK5WAA*	720				
SP2AVE	392	UK5VAA*	559				
SP2TT	78	UK5GBE*	168				
SOBABU	6	UK5GQ	145				
SO4H	18	UK5GJA*	44				
YU1BCD	469	UARDL	1131				
YU1NZW	90	UW6CA	8				
YU2ND	18	UK6LEZ*	4048				
YU2HAA	18	UK6AAJ*	691				
UC2WP	284	UK6FAA*	24				
UK2WAF*	1100	Check logs from:					
UK2AAA*	441	CP2BL, UK3MAA,					
UK2CAQ*	27	UK4PWW, UK4NAB,					
UK2BAO	60	UK4CAK, UK4WAK,					
UK2BAA	3542	UK4AA, UK5EAG,					
UK2PAA*	3404	UK6TAA, UK6APP.					
UK2BAA*	95						

ASIA

JA1OLT	1040	JA7ARW	3078	JA8-1887/1	0980	JAA-10378	6648
JA1IAT	178	JA7KXD	1800	JA1-11514	7988	JAA-8049	70
JN1CX	188	JA7EWS	168	JA1-16790	4824	JA7-457	132
JA1KQX	140	JA8BB	1120	JA0-1301/1	4361	JAA-3180	363
JK2BMB/1	140	JA8OTIE	806	JA3-8101	2022	JAA-1320	15662
JALB	110	JA8TBM	88	JA3-8853	238	JA0-1819	3092
JALB	84	JA9BYA	4650	JA3-8848	8	JAA-1052	225
JH1UKH	80	JA9CH	3325	JA4-10330	9860	UPG-012-74	58
JH1EJA	85	JA9CJW	729				
JH1BLX	40	JA9DUR	480				
JALB	12	JA9BHE	153				
JA1BUI	8	JA9LX	95				
JA1DBZ	2	JA0E2P	405				
JA1ZBX	2	JAGIAD	4				
JAZVUP	8812	UGBJJ	4				
JAZCPD	8277	UL7FM	1580				
JASHQA	7170	UL7GBM	182				
JAZH	2346	UH8DC	182				
JH2NOJ	2185	UIBACI	765				
JAZG	1573	UK8IAA*	1802				
JH2WMN	858	UJ5JA	368				
JH2PWO	351	UJ5B	9				
JH2BPT	324	UJ5PT	2101				
JAZXN	258	UACBGM	1438				
JAZGXD	210	UW2WL	854				
JH2RVP	152	UA9OCI	38				
JAZV5S	126	UW8AT	357				
JH2RM	24	UA0BT	39				
JAZBFB	12997	UAY5AR	4				
JH2LN	4	UW8PT	2431				
JAZGK/3	2784	UACBGM	1438				
JA3ARM	586	UK9AAD*	957				
JA3WHX	24	UK9LAA*	564				
JA4QR/3	108	UK9HAC*	444				
JH3JN	100	UADFGM	16638				
JAXXW	8006	UAM6I	4450				
JA4BJD	8400	UW01X	3408				
JALCL	682	UAD0AV	1428				
JH4BHM	300	UAD0AV	320				
JH4HD	110	UAD0AG	312				
JAYVL	18	UK0LAB*	6993				
JASBQ	10	UK6FAD*	603				
JH5YA	5568	UK6FAD*	414				
JASBP	6060	UK0FJA*	check				
JABKW	878	Check Logs:					
JABSD9	864	UL7TA					
JABLCJ	336	UA8NFM					
JATMJ	6930						

NORTH AMERICA

VE3BH	5130	W2GIF	check
VE7FE	1282	W4KXV	4428
VE7AZG	243	W4W5F	2037
MRIAT	2352	W4A4PG	2037
PJ2VD	964	W4HWW	108
W1EVT	2471	W5B5X	8020
W1PT	171	W5B5X	8020
W15CK	55	W5B5X	2662
W2GXD	8928	W5B5X	18400
W2W1	6330	W6KYA	1268

* denotes Multil Op. Station

WDGH	8	WLIK1	672
W7IR	10495	WUHS	5735
WJJA	2258	WOBAM	1780
WQWM	548	WQHW	704

SOUTH AMERICA

PT2GOK	30	HCIW	1872
PT7APK	11	LRADK	259

OCEANIA

KH6IJ	23008	VR1AA	25080
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SWL SECTION

BRS32525	5390	OK1-11861	120
A8482	1758	OK1-17323	112
DM2703/A	400	OK1-15689	48
DM5323/M	360	ONL-383	1572
DM5334/H	208	SP5-1598	1728
DM6405/H	198	SP6-7301	1485
DM2814/M	120	SP6-30003	224
WAT-200	454	UN1-098218	48
I4-20031	5840	UP2-038453	181L
I4-21171	1624	UA2-125138	168
I4-14376	808	UA3-142112	182
I5-10189	488	UA3-127-1	729
I5-50861	434	UA4-08543	6750
I5-55048	324	UA4-153773	729
I5-54661	18	UB5-06392	966
I5-523/RB	2	UB5-0681	680
I50-20007*	1092	UB5-070224	200
LA-155055	1004	UB5-077483	86
OK1-15638	682		

ASIA

JA8-1887/1	0980	JAA-10378	6648
JA1-11514	7988	JAA-8049	70
JA1-16790	4824	JA7-457	132
JA0-1301/1	4361	JAA-3180	363
JA3-8101	2022	JAA-1320	15662
JA3-8853	238	JA0-1819	3092
JA3-8848	8	JAA-1052	225
JA4-10330	9860	UPG-012-74	58

* denotes Multil Op. Station

PLEASE REMEMBER

1975 VK/2L/OCEANIA DX CONTEST
First two weekends in October 1975. Organized by WIA, Logs to WIA, Box 91002, GPO Perth, WA 6018 or N. Pentold VK8NE (Contest Manager), 388 Hunitas Road, Woodlands, West Australia 6018.

1975 VK/2L/OCEANIA CONTEST is part of NZART Golden Jubilee with Special Awards - held during first two weekends in October 1975. Logs for 1975 "VK/2L" to NZART, Box 488, Wellington, New Zealand or Contest Manager, Jack White 2L20X, 152 Lytton Road, Gisborne, New Zealand.

20 Years Ago

with Ron Fisher VK3OM

MAY 1955

May 1955 was a time for looking ahead. The new Federal President, Bill Mitchell, wrote about the forthcoming aims of the Federal Executive, their problems and hopes. Among the most important were a national plan for emergency network operation and the importance of having a representative at the next International Convention. A drive to increase membership was also high on the list.

May was a lean month for technical articles, the only one being a reprint from QST. A Discussion of Receiver Performance. Some fine points and unworked problems of receiver design. AVC, weak and strong signal reception, and cross modulation were discussed using the Collins 75A3 receiver as an example of current thinking. Much of the article was based on the problems of SSB reception.

Everyone was interested in a Convention. At least this was the impression one gets from reading an old copy of Amateur Radio. A full page was devoted to who was there, who won what, and what was served for supper at the Eleventh Annual Unigue Convention.

The DX activities page looked at a problem, somewhat new at that time, but still with us.

Commercial in the 7 MHz band. The suggested remedy - more activity boosted by contests, scrambles, certificates etc.

A large part of the magazine in those days was taken up with Divisional Notes. Actually four and a half pages of fine print for May. We all scanned the columns to see if we rated a mention.

Commercial Kinks

with Ron Fisher VK3OM

3 Fairview Ave., Glen Waverley, 3150

ALIGNMENT PROBLEMS WITH YAESU TRANSCEIVERS

A letter from Tom House VK2BHT on an alignment problem with his FT101B brought to mind a trouble that might be familiar to many FT200 owners. However, I will let Tom tell his story.

"There appears to be a rather serious design problem in the FT101B which owners should be warned about.

The initial symptom in my own unit was intolerably inaccurate preselector control tracking on 80 metres to the drive and receive stages. After two replacements of the same component, much mind-bashing, circuit checking and discussions with other amateurs, it was concluded that the driver plate inductance T-105, which is switched into circuit on 40 and 80 metres, cannot stand more than a few seconds of full carrier.

T-105's coil former is composed of plastic and under a condition of maximum steady-drive output, quickly softens and becomes distorted, finally jamming the tuning slug and making realignment impossible.

T-103, the 10-15-20 metre coil, does not seem to be affected in the same way. It is suggested that on 40 and 80 metres, when aligning or tuning up the unit, or adjusting an ATU, the carrier control should be used to hold the carrier level at all times to less than 200 mA. This will prevent overheating of T-105. It is also quite possible that the earlier 101s have the same defect."

Tom was aided in his efforts by VK2BF and VK2AFG.

I have had similar trouble with the plastic coil formers in the FT200 although I am sure for a different reason. After a period of time the slugs in the receiver antenna input and transmitter driver sections freeze up. If too much force is applied, the former will break off before the slug will move. Perhaps some of our readers have had the same trouble and found a solution to it. Up to date the only cure I have come up with is to replace the coil. Let me have your ideas.

Commercial Interest

It would be interesting to know just how much amateur gear is sold on the second hand market in Australia. What proportion of it is advertised in the Ham-ads of this magazine? Answers to these questions are just not available. However we can be sure that a very large quantity of equipment has been sold and that even more will be coming onto the market in the future. Just how do amateurs determine a price for a given piece of second hand gear?

I hope to publish some findings in a couple of months.

Hamads

- Eight lines free to all W.I.A. members, 56 per 3 cms. for other amateurs and S.W.I.'s.
- Copy should be in block letters or typewritten, signed and forwarded to The Editor, P.O. Box 150, Torry, Vic., 3142.
- Excludes commercial advertising.
- Closing date for Hamads is the 3rd day of the month preceding publication.
- QTH means the advertiser's name and address are correct in the current Australian Callbook.

FOR SALE

Transceivers 3.5 to 30 MHz bands. Only used two hours. Complete with AC PS & Manuals in English. ICOM IC730, solid state except transmit mixer & finals, \$200 & \$250. Also TRIO TS500 including extra VFO, \$300. ONO, Syd Clark VK3ASC, QTHR or Telephone (03) 45-3052.

Hamillaters SX 117 Receiver — HT 37 Transmitter, 80-10 MHz, VOK, SSB, CW — AM. Really good condition, \$300. ONO, VK4FT, M. Miller, 95 Fingrove Rd., Capalaba, Brisbane, Qld. 4157.

Yaesu FT1918. Little used, unmarked, as brand new with matching Yaesu external speaker and accessories. \$475. J. D. Moyle, VK4ZT, Yarwou, 4694, Qld.

Amateur Gear including serviceable BC340, home built bandswitched linear 6140s, power supplies, SSB exciter, \$100 the lot to clear, VK3AE, QTHR. Ph. (03) 90-0471 ext. 283 bus.; (03) 211-7965 A.M.

Digital Frequency Counter with pre-acaler to 200 MHz. 6 digit LED display, excellent cond. \$120. VK3UJ, Ph.: (03) 90-0424 (evenings only).

KRM KP282 Hand held 3 Mz FM Transceiver, modified to include earphone socket. Includes Ch 40, 45 & Rt, R4, also helical antenna, 10 nicks & a charger — only 4 months old, as new condition. The lot for \$180.00. B. Bathol VK3UJ, 3 Connewarra Ave., Appenzelle 3195. Ph. (03) 90-0424 (evenings only).

50 foot Telescope Tower, attached to 15 sq. 4 bedr. B/V home. Ideally situated on hill, excellent lot in all directions with nice outlook. Large brick garage and shack, easy to maintain QTH for XYL with considerate neighbours. Contact VK3ANI (soon to be VK6) in Upper Ferntree Gully on (03) 756-5791 for this bargain at \$24,990.

TCA 1677 single channel, very clean condition, circuit and mobile mount, \$65 ONO. VK3BAX, QTHR. Ph. (052) 97 401 evenings.

Yaesu FTDX 866, \$300; Tower 30 ft., \$75; Mosley Beam TAZ3 Jr. \$75; TCA 1675 FM 2m \$76; Realistic DC 1508, \$125. G. Snell, 305 High St., Chatewood 2067.

MR8A, 6 channel, crystals for 8 and 1 CW whip and mobile mount, very clean, \$65. Bendix BC433 LF RCV with 540 V supply, good cond., \$20. \$22 Tx and RCV, good cond., \$25. AR86 Tuning Unit only \$10. Peter Conway VK3ZHO, 10 Aiken St., Clifton Hill, 3068. Ph. (03) 469-1365.

Ewan 356C with crystal mike and SWR meter and 2W PSU, \$300. Account Late VK2BSR, contact Mrs. Ringrose, QTHR or Ph. Forster 305.

Drake R4C Rx with noise blanker plus xials for 160, 31 and 19 metres, twelve hours use only, \$625. VK3AIF, 6 Abassia St. N. Balwyn, 3104. Ph. (03) 857-5481.

FT DX576 with FT461 external VFO, \$450. VK3AIF, 6 Abassia St., N. Balwyn, 3104. Ph. (03) 857-5491.

Yaesu FT/FP 200, cond. as new, at B.R. price, unmodified, with manual, \$375 ONO. VK3EM, QTHR. Ph. (03) 58-7745.

Iyer R-33 disc recorder, 33, 45, 78, RPM, with sapphire cutters (3) and level meter, with portable case, cast alum. turntable, \$25. Tape Recorder, HB 7½" sec. with 12 reels of misc. tapes, xtal. mic. and built in speaker, spare reels, in sort. case and working order, \$15. VK6EM, QTHR. Ph. (03) 58-7745.

Carphone AWA MR10C High band, dual channel, DC PS (less vib), cables and handset cradle, mod. to 2 Mz, no xials, with speaker, EC, \$20. TV Healding, 17" table model, working order with all channels, useful for check checks, in cabinet, \$20. Filter xials in kHz, 444, 445, (2) 447, 448.

450, 452, 454 and 458. For BC 348, 912 and 917, the lot, 55. VK3EM, QTHR. Ph. (03) 58-7745.

AWA MR10C (6146 Final) low band, FM, carphone original, as new condition, transistor (2) power supply, control unit and cables, \$42. Price Reporter on 6m with xial, Rx tuneable, \$2. VK2PT, QTHR. Ph. (040) 43-1308.

FTDX100 Transceiver, 90-10 Mz, 230V DC, good condition, \$275 ONO. 4 Channel 2 Watt FM 148 MHz exciter, \$20, less xials, VK3AFO, QTHR. Ph. (03) 96-2414 A.H.

WANTED

455 kHz Mechanical Filter with a band pass of either 1000 or 1500 Hz. VK3ACA, QTHR.

Command Transmitter for wrecking. Exterior condition or frequency immaterial. VK3AFO, QTHR. Ph. (03) 96-2414 A.H.

Are there any amateurs interested in exchanging tapes of old time radio, Television programmes? Either Australian, British or American? Also, are there any collectors of cinema material? T. King VK2AJT, PO Box 45, Kensington, NSW, 2033.

Any back issues of: — Electronics Australia, Electronics Today, Amateur Radio or any other magazines for a school library. Contact: G. Scott, VK3ZEX ex VK3ZIP, QTHR. Ph. (03) 99-4945.

QSL CARDS — VK3AJU

**NOVUS
MATHATICIAN 4510**
immediate delivery \$81 p.p.
Student T/Ex available
NORSTATE ELECTRONICS
Box 582, Shepparton 3630

Silent Keys

Mr. C. C. GUINN VK3AWQ
Mr. R. G. GARRETT VK3BRG

VK3ZO

On 14 March 1975, Noel Storck VK3ZO passed away rather suddenly in Honolulu, Hawaii when on his way back to Australia after a holiday in USA, with his wife.

The writer took over the running of the VK3 inwards QSL Bureau from Noel in early 1961 — we had the easiest of handovers — the receivers one could wish for due to Noel's being up-to-date with the Bureau affairs VK3ZO, a PMQ Telephone Technician of long standing, had not enjoyed good health for the past two years and had had a bout of hospitalisation, but recovered sufficiently to enable him to commence (and almost finish) his one big wish of visiting Uncle Sam's country. He operated CW mainly, almost daily, from way back. His body was crumpled and brought back to Australia.

Eric Trebilcock
L30043

QSP

FM 80 BAND

It is interesting to note from circular letter B112 (T118) of 21st March from the Sec. of the ABCB that interested purchasers of FM receivers should be advised that only those covering the whole frequency range 88 to 108 MHz will provide adequate reception of the developing Australian FM service. He advises that action is being taken now to transfer the Newcastle national TV station from Ch 8 (101-108 MHz) to Ch 5A to free the band 101-108 MHz for FM transmissions in Sydney and Newcastle.

SILENT KEY

WARWICK PARSONS VK5PS

The sudden death of Warwick a few days before Christmas left all of us stunned at its unexpectedness. Talking with him a month before, he was full of plans for making the bands on 6SB with a new FT202, quite an event for such a CW man.

But the "Reaper" is no respecter of our personal plans for the future and we, his friends, are the poorer for Warwick's passing.

Warwick was associated with the Council of the VKS division from immediately after the war until his death, having held the offices of Vice-President, President, Immediate Past-President and Public Officer. During that time we remember how highly regarded were his Divisional notes to AR, and the weekly contribution to the "Advertiser" under his call sign SPS which did much to keep a good image of amateur radio before the public.

Whenever there was something to be done for the Institute, Warwick would be there assisting in his usual quiet way. So we find him captaining the CW team at the Annual Picnic CW/Phone cricket match, a delightful experience for all, for his sense of fun and the ridiculous was so characteristic of Warwick that we will always remember him thus. As late as November last we were "entertained" at one of his legendary "auctions" when most of us were privileged to see him in action for the last time.

Warwick was no "Yes" man. He held very strong principles and put them into practice, speaking his mind forcefully, but with due regard to the feeling of others. Thus he was an excellent chairman at Institute meetings, never forgetting that Amateur Radio is a hobby.

He had three great loves: love for his family, love for Amateur Radio, love for the Institute.

His greatest love was for his family and it is to them that our hearts go out in sympathy and compassion.

May they take comfort in the knowledge that Warwick was respected and loved by many including those who attended his funeral at Centennial Park, and by all who counted it a privilege to know him.

Warwick Parsons VK5PS was one of Amateur Radio's "GREATS".

VK3XU

HAM HEADQUARTERS!

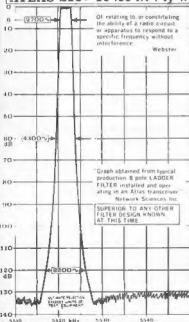
IC21A - \$298 DV-21 - \$298
BOTH FOR \$570

DV-21 DIGITAL VFO employs a PLL synthesised system with 59 ICs, 34 transistors, 1 FET and 37 diodes. It can be INTERFACED with the IC22 or any 2m transceiver with 44-45 MHz rx 18 MHz tx, 10.7MHz i.f., lwr side heterodyne, 8 x basic freq, for tx and 3 or 9 x basic freq, for rx. Only a slight modification is required for such equipment and is detailed in the operating manual. It operates in 5 or 10 KHz steps from 146 to 148 MHz and can scan either empty frequencies, or the frequencies being used, whichever you select. Complete separate selection of the transmit and receive frequencies is as simple as touching the keys. When you transmit, bright easy to read LEDs display your frequency. Release the mic switch and the receive frequency is displayed. These are two programmable memories for your favorite frequencies. You won't believe the features and versatility of the DV-21 until you've tried it. Price \$298 includes VICOM 90-day warranty.

THE IC21A is the 10w base station or mobile (146-148 MHz) with variable power control, adjustable deviation, 24 channels, built-in discriminator meter, 5 meter, SWR meter, PA protection, modular circuitry, runs from 13v DC or 240v AC. Complete with three channels. Price \$298

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AT OUR SHOW ROOMS.**

ATLAS-210: Se-lec-tiv-i-ty !!



HF TRANSCEIVERS

Atlas-210/215
SSB Transceiver \$570
Atlas 210M/215M
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AR-230 Power Supply . . \$150
AR-200 Portable AC
Power Supply \$96
Mobile Mounting Bracket
Deluxe Plug-in Model . . \$47
DC Battery Cable free
Mobile Bracket Kit \$6

OTHER HF GEAR TEST GEAR

YAESU FT101B 160/10m
AC-DC transceiver. Aut EX-
STOCK at \$585.
— YAESU FV-101B VFO for
FT101B — \$102.
YAESU FT75B 80w pep trans-
ceiver — \$245.
— AC power supply \$65, DC
power supply — \$75.
TRIO TS-520 all band transceiver
— \$560.
— external VFO \$80
YAESU FT-201 \$505
YAESU FT-2100B Linear \$388

TRIO CS1557 CRO DC-10MHz \$340
TRIO VT108 FET VOM 8 ranges 0.5 to 1.5kV, 11 meg input,
ohms 0.1 to 1000 meg, memory feature \$85
TRIO AG202A AUDIO GENERATOR covers 20Hz to 200
KHz 10v rms output, sine and sq wave, ext sync \$94
TRIO 75mm scope 20mv cm sens, dc to 1.5 MHz \$170
TRIO SG402 RF GENERATOR covers 100KHz to 30MHz
\$76
D-60 FREQUENCY COUNTER including 2 metre prescaler
\$360
GILCO 275 0-15 MHz frequency counter \$210
Persons not in possession of the appropriate
certificate of proficiency will not be sold amateur equipment.

SEIWA SV-230 2M FM, mobile incl 3 channels, 25
watts! \$210



6 METRES SSB

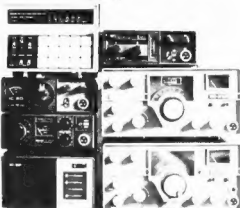
YAESU TS-620B transceiver (new
release) \$435
TRIO TRANSVERTER TV-506
\$212
ICOM IC-501 TRANSCEIVER
\$445

2 METRES SSB

YAESU FT-220 SSB/CW/FM
solid state transceiver \$480
TRIO TRANSVERTER TV-502
\$243

AUSTRALIA'S BEST SELLING 2M
FM rig — the IC-22A

IC22A 2M FM TRANSCEIVER replaces
the IC22 and is identical electronically,
but features a redesigned front panel
with easier-to-read channel selection. It
features switchable power 1 or 10 watts,
22 channels, solid state T/R relay,
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etc, and three channels — 1/4/50. Price is
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**SOLID STATE
SINGLE SIDEBAND
TRANSCIVER**



The Sensational ATLAS-210/215

TRANSMITTER SPECIFICATIONS:

- **Circuit:** Broadband design eliminates transmitter tuning. Single conversion from I.F. to output frequency. Includes ALC and infinite VSWR protection.
- **Frequency Control:** Internal VFO automatically provides transmission on exactly the same frequency as is being received. Rear socket provides for plug-in of 2nd VFO or crystal oscillator for separate control of transmit and receive frequencies, or for network and MARS operation.
- **Power Rating:** 200 Watts P.E.P. Input and CW input on 160, 80, 40, 20, and 15 meters. 120 Watts on 10 meters. (50 ohm resistive load 13.6 volt D.C. supply).
- **Power Output:** 80 watts minimum P.E.P. on 160 through 15 meters, 40 watts minimum P.E.P. on 10 meters. (100 watts typical on 160 through 15. 50 watts typical on 10 meters.)
- **Emission:** SSB (selectable USB or LSB), and CW.
- **Unwanted Sideband Suppression:** Better than 60 db at 1000 cycles.
- **Carrier Suppression:** More than 50 db below peak power.
- **Intermodulation Distortion:** Approximately 30 db below power.
- **Spurious and Image Output:** More than 40 db below rated power.
- **Harmonic Output:** More than 35 db below rated power.
- **CW Keying:** Manual send-receive. Semi-break-in when VOX accessory is installed in AR-117 power supply.
- **Transmit Control:** Press-to-talk with mic. button, or manual transmit with panel function switch. Automatic voice control when VOX accessory is installed in AR-117 power supply.
- **Microphone:** Dynamic or Crystal. Plug requirement: Standard phone plug, 3 circuit, 1/4 in. diam.

RECEIVER SPECIFICATIONS:

- **Super Selectivity:** A new 8 pole ladder design crystal filter provides unequalled selectivity. Frequency: 5520 kc. Bandwidth at 6 db: 2.7 kc for audio bandpass of 300 to 3000 cycles. Bandwidth at 60 db down is 4.3 kc. Bandwidth at 120 db is only 9.2 kc!! Ultimate rejection is greater than 130 db!!
- **Circuit Design:** No preamplification of signals. After passing through tuned circuits the signals are coupled into a low noise mixer using a double balanced diode ring. This provides exceptional immunity to overload and cross modulation, outperforming any receiver with R.F. amplifier.
- **Sensitivity:** Requires less than 0.3 microvolts for 10 db signal-plus-noise to noise ratio. (Typically 0.2 μ v.)
- **Image Rejection:** Better than 60 db.
- **Internal Spurious:** Less than equivalent 1 μ v signal.
- **AGC Characteristics:** Audio output constant within 4 db with signal variation from 5 μ v to more than 3 volts.
- **Overall Gain:** Requires less than 1 μ v signal for 0.5 watts audio output. (CW carrier.)
- **Audio Fidelity:** 300-3000 cycles, plus or minus 3 db.
- **Audio Power:** 2 watts to a 3 ohm speaker, less than 10% distortion.
- **Internal Speaker:** 3 inch, 3 ohm, .68 oz. magnet. Rear jack permits plug-in of headphones or external speaker. When Transceiver is plugged into the AR-117 power supply, a front facing 3 x 5 speaker is automatically connected.
- **Meter:** Reads S units, from 1 to 9, plus 10 to 50 db.
- **Calibrator:** Provides 100 kc check points for accurate dial setting.

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